derlying conditions, that the difference in volume as between this year and the two preceding years (1917 and 1916) has still to be made up and may eventually be added to the totals for the present year.

What the Short Lines Get Out of It

IT WAS PRETTY GENERALLY ADMITTED that the "short line" railroads, by being excluded from participation in government operation were subjected to hardship. The short lines claim that this hardship amounted to gross injustice. In the hearings before both the Senate and House committees representatives of the short lines individually and of the association representing these lines—the American Short Line Railroad Association—appeared and their testimony was listened to with respect. The efforts of the individual carriers, and especially of the American Short Line Railroad Association were quite successful.

The Transportation Act provides that the short lines not under government control in 1918 and 1919 shall receive for the six months' period subsequent to March 1, 1920, a rental similar to that received by the roads that were operated by the government in 1918 and 1919. The bill also deals with compensation for short lines not taken over, providing that there shall be retroactive compensation, but these provisions are not entirely clear. The Association claims that their provisions will entitle them to the same rental as roads taken over, and that therefore those companies which did not, in fact, succeed in earning as much, net, as they would have received as rental are now to be compensated for the difference.

Fully as important as the guarantee for the six months is the provision which empowers the Interstate Commerce Commission to fix divisions of joint through rates where the parties to the rate cannot agree on a proper division. Furthermore, the Commission is especially instructed to take into consideration the amount of revenues required to pay their respective operating expenses and the importance to the public of the transportation service of each, etc.

Short line railroads are generally originating roads. Where they connect with two or more competing large railroads they are in a position to drive a good bargain for a division of rates; but with only one, the short line is of necessity forced to accept the conditions imposed on it. The short lines have often been treated generously in regard to the loan of cars, etc., by their strong connections but undoubtedly there have been plenty of instances where the strong road drove a hard bargain in rate divisions. "Short line" section of the act is, therefore, a considerable victory gained by the American Short Line Railroad Association.

Another provision of the bill which may work out in the long run to great advantage for the owners of short line railroads is that dealing with consolidations. The history of the building of American railroads has pretty well established the fact that a 50-, 100- or 200-mile independent line, if it is successful, will be absorbed by one of the large systems. To provide against the building of lines simply to eventually sell them to a connecting railroad at a profit to the builder and a loss to the purchaser, the Transportation Act requires a certificate of necessity and convenience before a new line can be undertaken.

On the whole the Transportation Act treats the short lines very fairly—in some respects more generously, in proportion to earning capacity, than it treats the large railroad companies. The credit for this situation is, undoubtedly, due on the one hand to the weight which a local railroad owner has with his own Congressman and on the other hand to the admirable work of the American Short Line Railroad Association.

The Race Between Wages and Rates

ONE OF THE GREAT difficulties about the railroad situation in the past has been the fact that the causes for increases in their operating expenses have multiplied so rapidly that the rates from which the railroads earn revenue to pay their expenses have not kept pace with them. The provisions of the new transportation act seem to give some assurance for the future that increases in expenses shall be taken into consideration more promptly than they usually have in the past when rates are being determined, but it would be well for these who are planning now to object to the increases in rates that will result from the proceeding initiated by the Interstate Commerce Commission this week to remember to note that the increases in wages and in other items of the railroads' cost of living are still one or two jumps ahead of the rates.

The Interstate Commerce Commission on Monday began a hearing for the purpose of receiving the views of all interested parties as to its procedure in bringing rates up to a level calculated to produce the far return which the new law promises, but on the same day there was also held in Washington the second meeting of the conference commitees representing the railroads and the organization of their employees that have transferred their demands for more than a billion dollars additional increase in wages from the Railroad Administration to the companies. Also, during the week before the hearing, the President had received the majority and minority reports of the coal commission recommending further increases in the wages of coal miners which will inevitably result in a higher price for the fuel which represents a large part of the railroads' expenses.

This is notwithstanding the fact that the Interstate Commerce Commission is already confronted with a wage scale that has been increased during the period of government control about twice as much as freight rates have been advanced and that all of the numerous wage orders of the Railroad Administration that have been made effective since its first order, that was made retroactive to January 1, 1918, are not yet reflected in the rate level.

It is true that the railroad companies are guaranteed for six months the same net operating income that they enjoyed or got along with, as the case may be, in the three years ending June 30, 1917, but the employees, by the same law, are guaranteed for the same six months' period the rates of pay which they had been allowed up to February 29, 1920.

In the latter part of 1917 and the early part of 1918 the eastern railroads got a 15 per cent increase, and the southern and western roads a much smaller one, to meet the advances in wages which resulted largely from the passage of the Adamson eight-hour law which went into effect on January 1, 1917. The rate increases were also intended to take care of some other increases in expenses, notably in fuel. On May 25, 1918, Director General McAdoo issued his General Order No. 27 increasing wages retroactive to January 1, and also his General Order No. 28, which was intended to advance the rates sufficiently to meet both the new increase in wages and the advances in other items of operating costs which had accrued while the Interstate Commerce Commission was considering the 15 per cent case. The rate order, however, was not made effective until June and while the wage order was later found insufficient to satisfy the employees and supplemental orders continued to be made up to the end of federal control the Railroad Administration continued to be optimistic for the future and refrained from raising rates.

The result was that while the government during its operation of the railroads increased freight rates about 28 per cent, it increased wages about 56 per cent and the resulting deficit was passed on to the taxpayers. Director General Hines has preferred to explain his deficit by saying that the

derlying conditions, that the difference in volume as between this year and the two preceding years (1917 and 1916) has still to be made up and may eventually be added to the totals for the present year.

What the Short Lines Get Out of It

IT WAS PRETTY GENERALLY ADMITTED that the "short line" railroads, by being excluded from participation in government operation were subjected to hardship. The short lines claim that this hardship amounted to gross injustice. In the hearings before both the Senate and House committees representatives of the short lines individually and of the association representing these lines—the American Short Line Railroad Association—appeared and their testimony was listened to with respect. The efforts of the individual carriers, and especially of the American Short Line Railroad Association were quite successful.

The Transportation Act provides that the short lines not under government control in 1918 and 1919 shall receive for the six months' period subsequent to March 1, 1920, a rental similar to that received by the roads that were operated by the government in 1918 and 1919. The bill also deals with compensation for short lines not taken over, providing that there shall be retroactive compensation, but these provisions are not entirely clear. The Association claims that their provisions will entitle them to the same rental as roads taken over, and that therefore those companies which did not, in fact, succeed in earning as much, net, as they would have received as rental are now to be compensated for the difference.

Fully as important as the guarantee for the six months is the provision which empowers the Interstate Commerce Commission to fix divisions of joint through rates where the parties to the rate cannot agree on a proper division. Furthermore, the Commission is especially instructed to take into consideration the amount of revenues required to pay their respective operating expenses and the importance to the public of the transportation service of each, etc.

Short line railroads are generally originating roads. Where they connect with two or more competing large railroads they are in a position to drive a good bargain for a division of rates; but with only one, the short line is of necessity forced to accept the conditions imposed on it. The short lines have often been treated generously in regard to the loan of cars, etc., by their strong connections but undoubtedly there have been plenty of instances where the strong road drove a hard bargain in rate divisions. "Short line" section of the act is, therefore, a considerable victory gained by the American Short Line Railroad Association.

Another provision of the bill which may work out in the long run to great advantage for the owners of short line railroads is that dealing with consolidations. The history of the building of American railroads has pretty well established the fact that a 50-, 100- or 200-mile independent line, if it is successful, will be absorbed by one of the large systems. To provide against the building of lines simply to eventually sell them to a connecting railroad at a profit to the builder and a loss to the purchaser, the Transportation Act requires a certificate of necessity and convenience before a new line can be undertaken.

On the whole the Transportation Act treats the short lines very fairly—in some respects more generously, in proportion to earning capacity, than it treats the large railroad companies. The credit for this situation is, undoubtedly, due on the one hand to the weight which a local railroad owner has with his own Congressman and on the other hand to the admirable work of the American Short Line Railroad Association.

The Race Between Wages and Rates

ONE OF THE GREAT difficulties about the railroad situation in the past has been the fact that the causes for increases in their operating expenses have multiplied so rapidly that the rates from which the railroads earn revenue to pay their expenses have not kept pace with them. The provisions of the new transportation act seem to give some assurance for the future that increases in expenses shall be taken into consideration more promptly than they usually have in the past when rates are being determined, but it would be well for these who are planning now to object to the increases in rates that will result from the proceeding initiated by the Interstate Commerce Commission this week to remember to note that the increases in wages and in other items of the railroads' cost of living are still one or two jumps ahead of the rates.

The Interstate Commerce Commission on Monday began a hearing for the purpose of receiving the views of all interested parties as to its procedure in bringing rates up to a level calculated to produce the far return which the new law promises, but on the same day there was also held in Washington the second meeting of the conference commitees representing the railroads and the organization of their employees that have transferred their demands for more than a billion dollars additional increase in wages from the Railroad Administration to the companies. Also, during the week before the hearing, the President had received the majority and minority reports of the coal commission recommending further increases in the wages of coal miners which will inevitably result in a higher price for the fuel which represents a large part of the railroads' expenses.

This is notwithstanding the fact that the Interstate Commerce Commission is already confronted with a wage scale that has been increased during the period of government control about twice as much as freight rates have been advanced and that all of the numerous wage orders of the Railroad Administration that have been made effective since its first order, that was made retroactive to January 1, 1918, are not yet reflected in the rate level.

It is true that the railroad companies are guaranteed for six months the same net operating income that they enjoyed or got along with, as the case may be, in the three years ending June 30, 1917, but the employees, by the same law, are guaranteed for the same six months' period the rates of pay which they had been allowed up to February 29, 1920.

In the latter part of 1917 and the early part of 1918 the eastern railroads got a 15 per cent increase, and the southern and western roads a much smaller one, to meet the advances in wages which resulted largely from the passage of the Adamson eight-hour law which went into effect on January 1, 1917. The rate increases were also intended to take care of some other increases in expenses, notably in fuel. On May 25, 1918, Director General McAdoo issued his General Order No. 27 increasing wages retroactive to January 1, and also his General Order No. 28, which was intended to advance the rates sufficiently to meet both the new increase in wages and the advances in other items of operating costs which had accrued while the Interstate Commerce Commission was considering the 15 per cent case. The rate order, however, was not made effective until June and while the wage order was later found insufficient to satisfy the employees and supplemental orders continued to be made up to the end of federal control the Railroad Administration continued to be optimistic for the future and refrained from raising rates.

The result was that while the government during its operation of the railroads increased freight rates about 28 per cent, it increased wages about 56 per cent and the resulting deficit was passed on to the taxpayers. Director General Hines has preferred to explain his deficit by saying that the

first rate case was not made soon enough, and that the failure to make a second increase was a matter of policy, although the increase in the deficit during 1919 as compared with 1918 demonstrates that the first increase was not made sufficiently high when it was made.

The fact therefore remains that wages have continued to increase throughout 1918 and 1919 while the rates have not been changed (except in the way of local or particular adjustments) since June, 1918, and yet the demand for new increases in wages has already got a start on the rate case.

The Space Interval on Railroads with Light Traffic

THE BUTTING COLLISION at Onawa, Maine, on December 20, 1919, killing 23 persons, afforded a striking illustration of the need of the block system on single track railroads of moderate or light traffic. Such roads carry fewer passengers and run trains less frequently; the fatalities of a year or a series of years not only are small absolutely but even may be small comparatively when considered with the records of busier roads, for the single track has elements of safety not enjoyed by the double-track and four-track lines. The thin line, however, aims to carry its passengers in as few trains as practicable, with economy, so that individual wrecks are likely to be as bad as those on larger roads. This lesson of the Onawa wreck, discussed in our issue of January 30, page 342, is reinforced by the additional details given in the report of the Interstate Commerce Commission on the case, which is abstracted in another column of this issue.

The subdivision of road on which the collision occurred is 117 miles long and has, in the 94 miles having no block system, nine telegraph offices, making the average distance between meeting points about nine miles. In 15 days in December the average train movement was 41 a day, or an average of 20½ trains each way. This makes the average time between trains following one another about one hour and ten minutes. Unless the traffic is distributed very evenly over the 24 hours the intervals between trains are often much shorter than this. On any such line, with such a traffic, they must be expected to be much shorter on very many occasions every week, probably every day. Therefore there are bound to be delays all the time; and where delays occur all the time the natural recourse is the general introduction of permissive blocking.

There is the crux of the problem. Permissive blocking is not blocking at all. With it the block sections are left long when they ought to be shortened, and that means the continued use of the time interval system and, for opposing movements, continued dependence on the despatcher and all the old methods. Shortening the block sections costs much money and the cautious manager, worried over ways of finding needed funds, lacks the courage to make the improvement. He can defer it and still, very likely, show as small a percentage of passengers killed as any other manager with whom he is likely to be compared. The universality of this perplexing burden on the individual manager, paralyzing his efforts at improvement, is the justification of the law designed to make block signaling compulsory. A compulsory law can be made to bear equally on all roads; and under it the public, which must finally bear the expense of safeguarding its steel highways, will know where to place responsibility for any dereliction.

It is right and desirable to get this question before the public as vividly as possible, and that is another justification for a compulsory law. It is desirable that the public shall realize that our railroads already accomplish a high degree of safety; and that in making travel still safer we are pursuing a very high ideal. We are paying a high price for the last inch of protection. For 75 years we have been satisfied with what may be called reasonable safety. We now aim at perfect safety, and there is no escape from paying what it costs. The fact that in calling for the general introduction of the space interval the government is demanding a high standard—is almost justifying the position of those who claim that it is a refinement too costly to be indulged in as a feature of every day life—was brought out significantly by Mr. Beaumont the other night at the New York Railroad Club (see report elsewhere in this issue), when he, a signal engineer and inspector of many years' experience, estimated that the cases, within his own knowledge, where enginemen had run past stop signals, *without any collision resulting*, would number *hundreds*. It is a plausible assumption that where the chances of disaster are so small the sin of postponing improvements cannot be classed as a very black one. This assumption is not often put into words, but the fact that it exitsts in the thoughts of innumerable railroad officers who are responsible for present conditions, is the explanation of a material portion of our disgraceful collision record.

The manager who thinks that the risks which he runs are small, should look oftener at the other side of the record. Another point made by Mr. Beaumont was that figures showing percentages of persons killed do not afford any instructive light on the collision problems. When a carload of passengers is killed in 20 seconds, the public (Congress) cannot be made to take an interest in percentages; the demand is for a way of preventing that particular kind of disaster. It is true that the startling disasters are infrequent, comparatively; but the conscientious manager aims at total abolition, and he must guard every point. The Interstate Commerce Commission, from its accident files, can show flagrant cases every month. The investigations published constitute only a fraction of the record.

On November 16, 1919, the investigation of a rear collision of freight trains on the Chicago Great Western at Harlan, Iowa, causing one fatality, showed that freight trains were run at night a distance of 83 miles over a line where there was only one intermediate telegraph office. The second train began its trip 50 minutes behind the first one, but after running 43 miles it was only ten minutes behind; the leading train stopped, and there the collision occurred. Obviously the time-interval rule is of very little value under such a condition, and to run permissively is equally out of the question except perhaps in clear weather, in daylight, where there are no curves.

On December 22, 1919, near Huntsville, Mo., on the Wabash Railroad, passenger train No. 12 ran into the rear of a local freight train, causing the death of an employee; the investigation showed that the passenger train, running under a caution card, about an hour after sundown, traveled six miles in about seven minutes. In this case, as in the one at Harlan, the trouble occurred in or near yard limits and the blame was not placed entirely on the following train; but, in both cases, the attempt to save time by suspending the space interval principle was an outstanding feature.

A conservative critic would say that a rule requiring trains to run under control through a block section six miles long, could not be expected to work out satisfactorily; but in this case the inspector found that the caution card issued to train No. 12 on December 22 was numbered 868 (over 40 cars a day), indicating that such movements were very numerous. Furthermore, he concluded from the evidence that the restrictions intended to be placed upon trains being operated under caution cards were not generally observed.

Thus we find two prominent roads on which the problem is the same as on the Canadian Pacific. Enforcing the block system with forty-mile block sections necessitates very long time intervals, which may mean costly delays. To enforce

it with six-mile blocks must in many cases appear to the trainmaster to be an intolerable restriction on his efforts to move trains economically. But that is the issue; and if the Interstate Commerce Commission exercises the powers which it now possesses, it will be an issue which must be met.

The Pan-American Railroad

A RAILROAD extending from Hudson Bay, Canada, to Patagonia, South America, serving as a link between the three Americas, may in the past have been considered visionary, but the progress in railroad building that has come about in Central and South America during the last 50 years lends something of a corporeal form to the ideal.

Conceived over 50 years ago by a former United States Consul in South America, Hinton R. Helper, the project has in the past received the support of Andrew Carnegie, James G. Blaine and other prominent Americans. As a result of the International American Conference held in Mexico City, Mex., in 1902 the project was given added strength, and a permanent "Pan-American Railway" committee, comprising diplomats of Latin America and the United States, was appointed. The recent Pan-American financial conference held at Washington, D. C., again brought up the matter.

The interest of South America in the Pan-American Railway, as it has sometimes been called, has seldom lagged. Chile has completed a railroad running south and north, adding a link to the nucleus of the projected line. Bolivia has closed up most of the gaps in her north and south lines, only slightly more than one hundred miles of track remaining to be laid. A railroad from Valparaiso, Chile, to Buenos Ayres, Argentina, has been completed. Branch lines of Brazilian railroads have been connected with Uruguayan and Argentinian lines. The Peruvian government is at present considering the construction of a railroad which is to reach the region of navigable rivers, affluent to the Amazon, in the north. This new line, starting at a point in the Cerro de Pasco region, would tap extensive virgin forests of valuable timber. The Peruvian Railway Construction Company, organized on February 5, 1919, considers constructing railroads in other parts of that republic.

The greatest difficulty to be overcome in a proposed construction of the Pan-American Railroad would be the crossing of Central America. There the population apparently is not deeply interested and the geological conditions to be met with are discouraging.

Whatever may come of the scheme, there is no doubt that it would prove of great commercial and social value. Trade relations between the countries of Latin America and the United States undoubtedly would be bettered. A journey by rail from the Arctic circle to the southern tip of South America would approximate 10,000 miles, and under good traffic conditions it is estimated that the trip could be made in from 10 to 12 days via the "Pan-American." At present 24 days are required for the 5,871 miles sea voyage from New York City to the capital of Argentina.

In the present confused condition of railroad matters in the United States the time is not propitious for active consideration of the Pan-American Railroad, but the time will come when it will not only be feasible but will actually be attempted. While capitalists of Great Britain have interests in South America estimated at $4,000,000,000, mostly in Argentina, and French and Belgian capital is invested heavily in South America railroads, the war has made it virtually impossible for European countries to continue financing such ventures. As a result, delegations from Colombia, Peru, Chile, Brazil, Ecuador, Uruguay, Paraguay and other South American states have visited the United States in recent years and are within our borders now attempting to awaken American investors to what they call "a big investment opportunity"—the Pan-American Railroad.

DEMOCRATIC ADMINISTRATION
Y'WOULDN'T THINK WHEN IT WAS SO EASY TO TAKE A-HOLT OF THE THING IT WOULD BE SO DANGED HARD TO LET GO!
R.R. DEFICIT SHOCK!
R.R. STRIKE THREATS
PRIVATE OWNER
RAILROAD
LINES
GALE

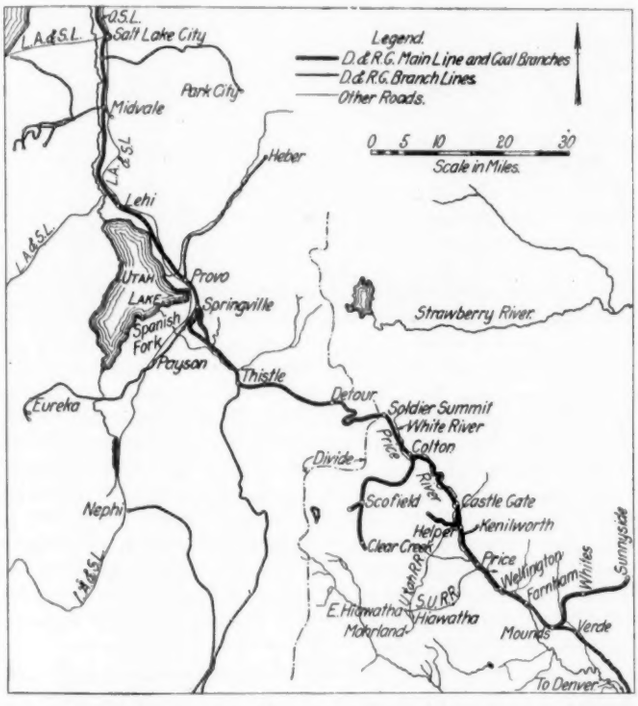
It's Been a Shocking Experiment

Out of the Desert

A Terminal Built for Special Operating Conditions

Physical Obstacles Are Also Responsible for Unusual Design of D. & R. G. Yard at Soldier Summit

OF THE OBSTACLES imposed on the Denver & Rio Grande in its efforts to afford adequate transportation for the valuable products of the rugged territory it serves, one of the most formidable is that imposed by the Wahsatch mountains to the coal traffic moving westward into the Great Basin from the Utah coal field. This field, because of the



Relation of the Coal Fields to the D. & R. G. Line Into Salt Lake City

competition of Colorado mines, has of necessity found its market in the Great Basin and areas to the west, southwest and northwest and since the field lies entirely on the east slope of the Wahsatch mountains, the crest of which forms the eastern rim of the Great Basin, all of the coal and coke produced in this region must be lifted over the range to reach its market. With the development of this coal field, the resultant traffic has imposed some interesting operating problems on the Denver & Rio Grande.

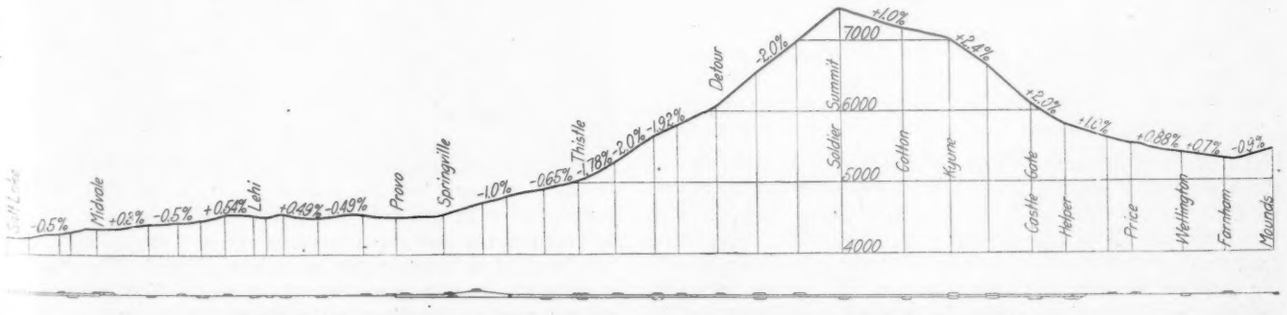
The first important step to expedite transportation on this line, subsequent to its construction in 1883, was the change from narrow to standard gage in 1890. Still more important was the Soldier Summit grade change in 1913 that eliminated the seven miles of four per cent grade which, although on the western or downhill slope, had long imposed a far greater obstacle to the traffic than the 2.4 per cent grade on the east or uphill slope. Experience subsequent to this change demonstrated that the existing operating arrangements did not permit of a full realization of the advantages accruing from this second improvement. As a consequence, a third betterment of this line was undertaken to accomplish a rearrangement of the terminals and engine districts that would best meet the physical conditions and the traffic requirements of the line.

This improvement, which has just been completed, involves the shortening of the first engine district east of Salt Lake City, by moving the terminal from Helper 25 miles up the east slope to the crest of the Wahsatch range at Soldier Summit. This rearrangement of terminals embodies many points of interest not only because of the operating arrangements which made it desirable, but also because of the engineering problems imposed in the placing of an engine terminal and yard in an adverse location.

Physical Characteristics

The physical characteristics of the Utah division of the Denver & Rio Grande are shown in the accompanying map and profile. The mines are all located either on the main line or on branches leaving the main line, between Mounds and Colton. In other words, they are practically all located on the grade rising westward to Soldier Summit. The 13 miles of this line between Helper and Kyune varies from 2 to 2.4 per cent, while the 12 miles just east of the summit, has a maximum of one per cent. From Soldier Summit westward the grades are downhill practically all the way to Salt Lake City, the maximum grade against eastbound traffic being two per cent. There are some minor grades of not over 0.54 per cent against westbound traffic. The line is double tracked from Helper to Provo, 75 miles, and from Midvale to Salt Lake City, about 10 miles.

Some idea of the coal and coke traffic may be obtained from the tables giving the 1916 figures, the last year for which complete data are available. Owing to the increase in coal production since that time the totals cannot be said to be representative of the present conditions except as they indicate a general relative distribution of the output and the relation between eastbound and westbound traffic.



Profile of the Denver & Rio Grande Between Mounds and Salt Lake City

Of specific importance is the fact that the coal and coke

traffic passing westward through Soldier Summit represents about 85 per cent of the total westbound net tonnage and that the total net tonnage westbound is about four times as great as the revenue tonnage eastbound. However, a large part of the eastbound train movement into Soldier Summit consists of the empties returned to the mines, since there are no available empty cars from the east which can be loaded with coal or coke for further westbound movement.

APPROXIMATE FREIGHT TONNAGE PASSING SOLDIER SUMMIT

Calendar Year—1916

Destination—Westbound.

	Coal.	Coke.	Total.
Company coal	400,000		400,000
Other railway locomotives	132,208		132,208
Utah points on other roads	455,957	57,120	513,077
Nevada	202,492	1,456	203,948
California	268,432	16,763	285,195
Idaho	284,441	22	284,463
Montana	19,491	179,098	198,589
Oregon	31,851		31,851
Washington	48,601	325	48,926
Wyoming	100		100
Local Utah points	829,419	153,143	982,562
Total coal and coke	2,672,992	407,927	3,080,919
Other traffic all points West			592,647
Total westbound traffic			3,673,566
*Total eastbound traffic			897,046
Total traffic passing Soldier Summit			4,570,612

* No coal or coke moves east through Soldier Summit.

Need for a Change in Operating Arrangements

Prior to the improvement work completed in 1913, the maximum descending grade west from Soldier Summit was four per cent and the length of trains was limited to the tonnage that could be safely handled by the locomotive of given braking capacity. Thus, Mallet and consolidation engines equipped with 8½-in. cross-compound Westinghouse air brakes were rated at 1,150 tons and when equipped with 11-in. simple air pumps to 950 tons. Thus, this descending grade rather than the two per cent ascending grade approaching Soldier Summit from the east was the prime factor in determining the engine ratings, in making up trains from the mines for Salt Lake City.

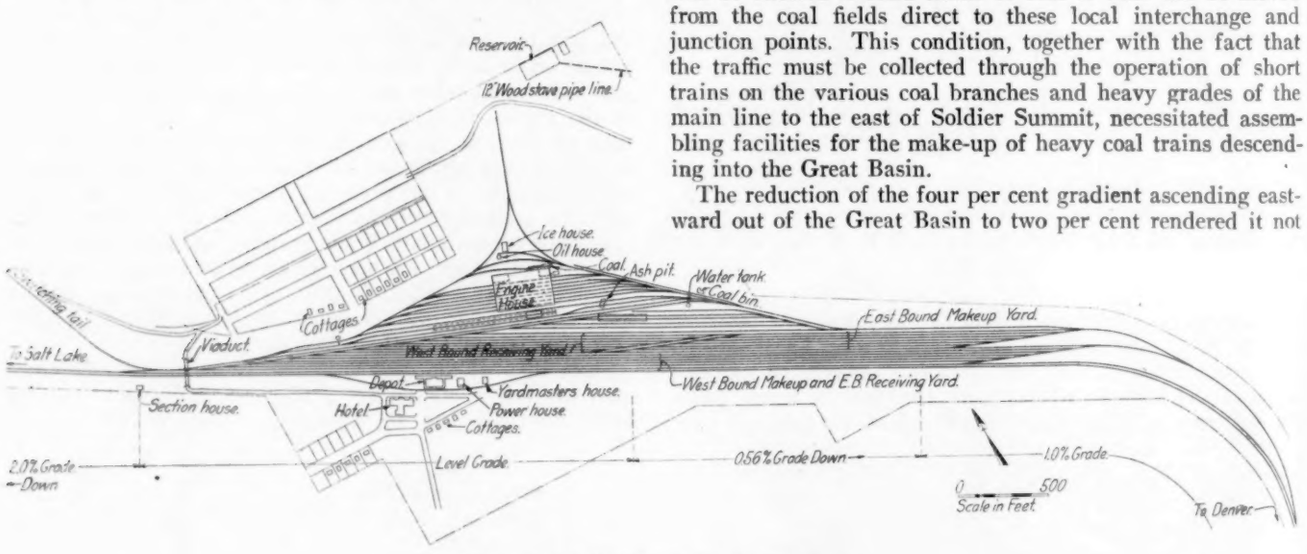
This situation has been entirely changed by the elimination of the four per cent grade since, with a maximum grade of two per cent descending, the limit of tonnage per train is almost entirely removed. It is now practicable to run 65-car trains westward from Soldier Summit and this is a considerably greater train length than it is practicable to operate from the mines to the summit.

When the products of a group of mines is distributed to widely separated markets, economy and efficiency in transportation demand some central point of classification where the loaded cars from the individual mines are grouped according to destination and the empty cars may be equitably and effectively distributed to the mines. Since, as has been pointed out, all the coal and coke originating in this particular field moves to the west, it follows that a point of classification should be west of the most westerly mines. It is a rare coincidence that in this case, Soldier Summit, which is located at the apex of the eastbound and westbound grades, should be just beyond the west edge of the coal fields. Therefore, with the terminal at Soldier Summit, it is not only possible to make up trains of empty cars for destination to the various mines with return runs of loaded cars from these mines, but it is also entirely practicable to make up solid trains of coal destined for certain points of consumption on the tracks of the Denver & Rio Grande, or for certain interchange points with other roads.

The coal and coke from the Utah fields may be classified as follows: That destined for local Utah points in the Great Basin, Utah points on connecting lines, southwestern points on the Los Angeles & Salt Lake, western points in Nevada and California on the Western Pacific and the Southern Pacific and northwestern points in Idaho, Montana, Oregon and Washington, reached via the Oregon Short Line. Interchange of this traffic with connecting lines is effected at Provo, Salt Lake City and Ogden, while junctions with branches serving local Utah points off the main line occur at Thistle, Springville, Provo, Midvale and Salt Lake City. It will, therefore, be apparent that great facility of operation will be effected if solid trains of coal or coke can be moved from the coal fields direct to these local interchange and junction points. This condition, together with the fact that the traffic must be collected through the operation of short trains on the various coal branches and heavy grades of the main line to the east of Soldier Summit, necessitated assembling facilities for the make-up of heavy coal trains descending into the Great Basin.

The reduction of the four per cent gradient ascending eastward out of the Great Basin to two per cent rendered it not only possible, but practicable and economical to haul long trains of empties into the coal fields from the west. Perhaps no one mine in the field has a productive capacity sufficient to require, for one day's loading, all the empty cars which can be hauled in one train into the coal field. Consequently, a train of empties from the west must be distributed among several mines according to the respective productive capacity of each mine.

Just as in the case of the assembly of loads for westward movement, so Soldier Summit seemed to be the logical place for the distribution of empties to the various mines. This selection renders it practicable and economical for train and engine crews to serve the mines daily and return with loads to



Map of the Soldier Summit Terminal

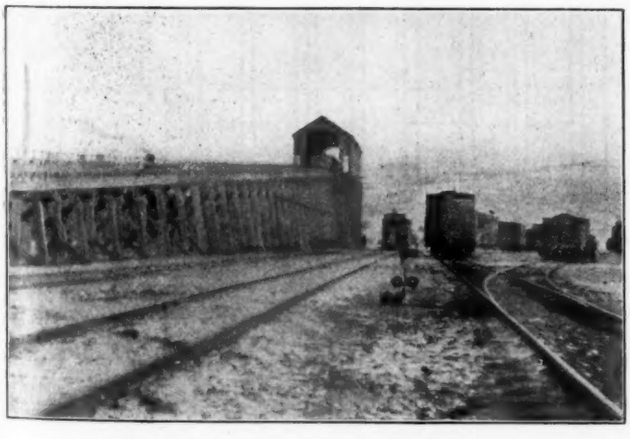
the home terminal in the period prescribed by the Hours of Service act.

Coupled with the above-mentioned advantages of Soldier Summit as a site for a division terminal, is the very desirable equalization in length of operating districts. The old district, from Green River to Helper, was only 71.3 miles, while the adjoining district, from Helper to Salt Lake City, was 118.6 miles long, and all the mountain grades were on the longer of these two districts. By moving the terminal from Helper 25 miles westward to Soldier Summit the adjacent operating

Looking East from West End of Yard

districts are more nearly equalized as to length, the distance from Green River to Soldier Summit being 96.3 miles and the distance from Soldier Summit to Salt Lake City 93.6 miles.

Another important factor is to be found in the fact that a careful air brake and general train inspection and test must be made on all trains descending either way from the summit. It is decidedly more economical as well as conducive to the greatest efficiency to have such inspections and tests made by the thoroughly organized forces of inspectors with permanent facilities and appliances for the purpose. There is always



The Coal Chute Trestle

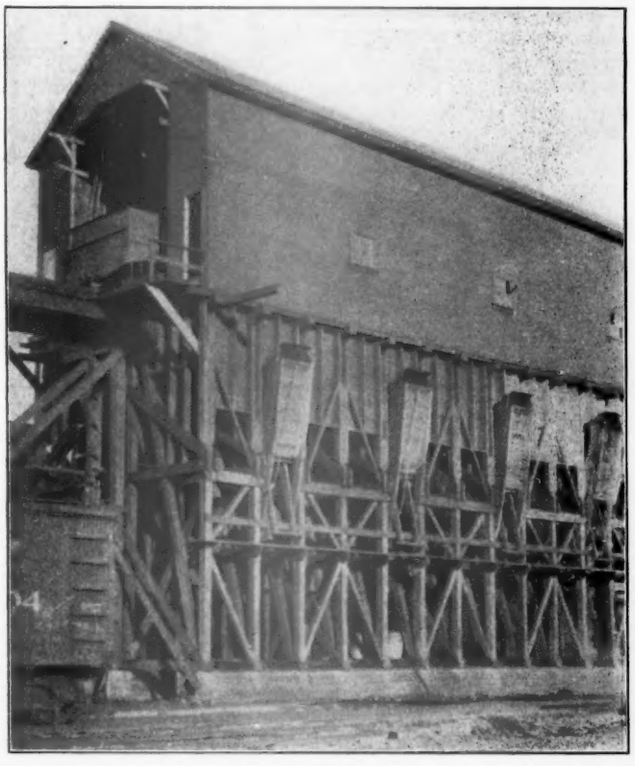
great difficulty in maintaining a competent force and adequate facilities for such purposes at outlying points. Consequently, a division terminal at points where rigid inspections must be made is a distinct advantage.

Requirements of the Terminal

From a consideration of the foregoing statement of the operating conditions, it is seen that the trackage requirements at the division terminal included a receiving yard for long trains of empty cars arriving from the west, a receiving yard for shorter trains of loaded cars arriving from the east, a classification and departure yard for trains of empties eastbound for coal loading and an assembly and departure yard for the long trains of loaded coal cars westbound. The requirements for this purpose under present traffic are for 10 coal trains westbound out of the terminal, 9 empty coal car trains eastbound into the terminal and a larger number of trains of 45 cars or under operating on turn-around runs between the terminal and the mines. A further idea of the requirements of this terminal is indicated by the fact that 31,351 cars were handled through the terminal in the month of December, 1919. Aside from the classification yard, the terminal must furnish complete accommodations for turning engines of which the daily output is 12 Mallet engines and 53 other engines.

Difficult Engineering Problems

The difficulty of locating a classification yard at the apex of grades descending in both directions in mountainous country can well be imagined. Not only was the alinement of



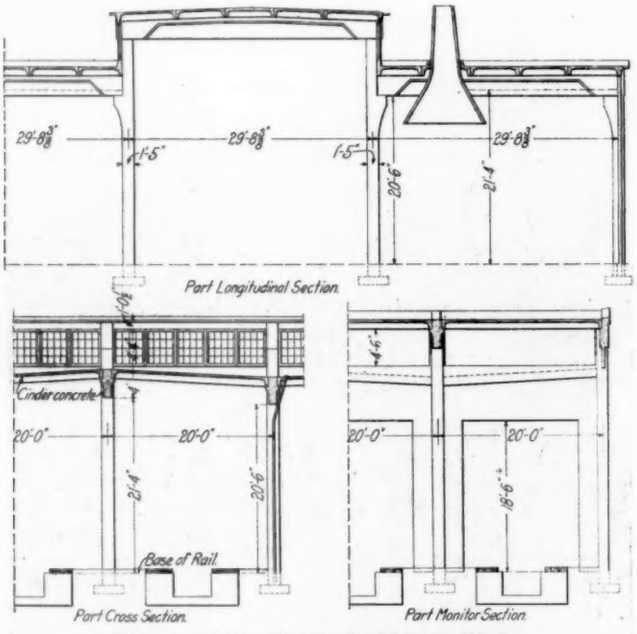
The Coal Chute

the main track, which conformed to the topography of the country, subject to considerable curvature but there was only 2,750 ft. of level track and 1,650 ft. of 0.56 per cent grade between the one-per cent grade descending eastward and a two-per cent grade descending westward. By going to rather extensive grading, it was possible to re-locate the main line so as to secure a tangent for the entire 4,150 ft. of distance between the ends of the two per cent and one per cent grades, but it was impossible to reduce the summit elevation so as to increase this distance. The length of the yard, therefore, was necessarily restricted to these limits which is not any more than the length required for a 100-car train. Under the circumstances, it was impossible to lay out the yard for the conduct of the classification by a progressive movement in the direction of the movement of the traffic. As a consequence, the various units of the yard had to be located in parallel groups within the fixed limits. To secure the desired length at the east end of the yard, the tangent of the yard tracks

was extended considerably beyond the point of curvature of the main track, necessitating main line connections at some distance beyond the end of the yard.

The location of the several yard units in groups side by side necessitated a shuttle movement for the operation of the yard and since this yard arrangement necessarily entailed switching movements beyond the end of the yard proper in either one direction or the other, and since it would have been impracticable to carry on this switching on the heavy main line grade at either end, a switching tail or drill track was constructed from the throat of the yard at the westerly end, supported on a one-per cent ascending grade.

As seen on the map, one grid of tracks is used for the westbound make-up and eastbound receiving yard, while the westbound receiving yard and the eastbound make-up yards comprise two shorted grids, placed end to end. Under the plan of operation short cuts of cars are taken from the receiving tracks and switched into the departure tracks with an eastbound movement which is either on the level or on the 0.56 per cent



Structural Details of the Engine House

down grade. All of the engine house facilities and car repair yards are located to the north of the classification yard.

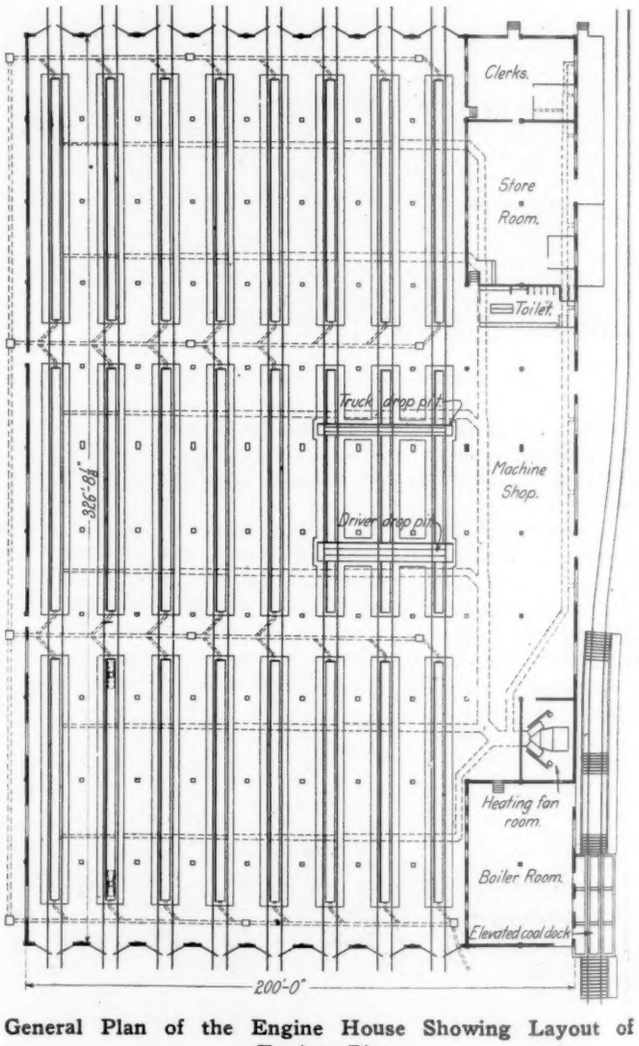
The whole plan of the yard layout was the subject of much study, owing to the heavy expense of grading and to the fact that lowering of summit elevation was out of the question. As finally designed and constructed, the grading quantities amounted to upwards of 460,000 cu. yd. of excavation practically all of which was solid rock.

The Engine Terminal

The distinctive feature of the engine terminal is a rectangular house, an innovation undertaken because of the considerable number of Mallet engines which must be accommodated at this terminal and the difficulty encountered as in all regions subject to heavy snowfall, in keeping the turntable pit clear for operation. The adoption of this type of house was obviously the most important factor in the design of the engine terminal yard. A turning wye was, of course, necessary, and in order to save distance traveled by locomotives in turning, entering and leaving the house, the layout of the house, serving tracks and wye necessarily demanded compactness as a distinguishing feature. The engine house is served by eight through tracks, each of which is equipped with three engine pits, making a total capacity of 24 locomotives. A powerhouse, heating plant and storehouse is also housed under the same roof and the whole is enclosed between the two legs of the wye. The location of the coaling station, the tracks, ash pits and the other auxiliary facilities are clearly indicated on the map.

The Engine House

The house is of the "Unit Bilt" reinforced concrete type, a total of 953 units being used in its construction. The framing consists of columns spaced 20 ft. center to center across the house and 29 ft. 8⅜ in. parallel with the tracks, and carrying longitudinal girders that support concrete slabs spanning transversely. All columns are 27 ft. high above



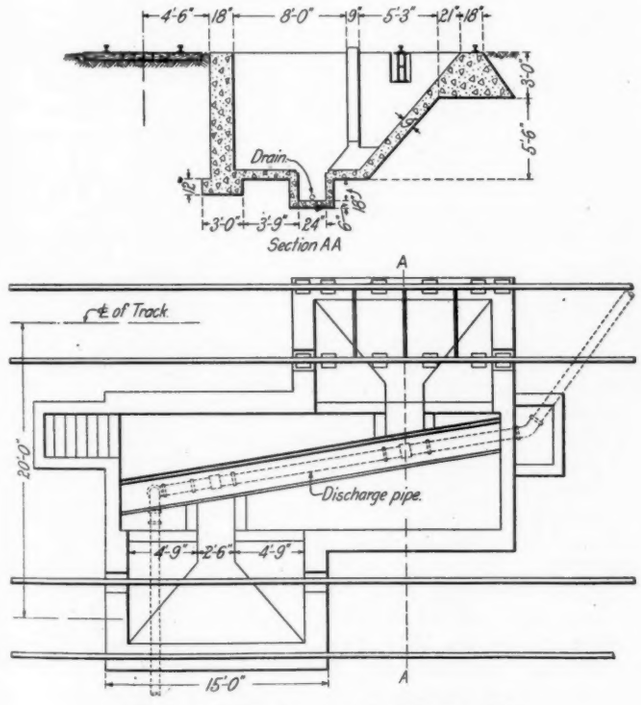
General Plan of the Engine House Showing Layout of Engine Pits

top of rail with corbels on one side 7 ft. from the top, thus providing alternate high and low girder seats and resulting in five high and six low transverse roof bays. The monitors thus formed are fitted with sash, 24 panels of which are pivoted and operated from the floor. The high girders are crowned slightly in the center to provide drainage. The low roof bays have alternate high and low supports, so that the drainage may be collected at low points and conducted by galvanized leader pipes to the engine pits. The entire roof area is covered with two layers of roofing paper and three moppings of hot asphalt pitch. The side walls are formed of slabs with openings for large triple-transom windows and track doors which are double side swing wooden doors affording an opening 14 ft. wide by 18 ft. high.

There are 24 engine pits in the house, three to each of the eight tracks. The pits are 88 ft. in length with walls of mass concrete 3 ft. wide and 3 ft. 10 in. deep, reinforced with heavy triangle wire mesh and provided with rail plates set 24 in., center to center. Screened sumps at the ends lead to vitrified tile drains with concrete manholes at convenient intervals. Concrete drop pits for both drivers and trucks cross three of the engine pits with swinging girder bridges to carry the track rails across the drop pits.

The north 40 ft. of the building is occupied by the master mechanic's office, a storeroom, a machine shop, the heating plant and a boiler room. The floors of the master mechanic's office and storeroom are elevated four feet above the engine house floor, while the fan room and boiler room floors are depressed a like distance. These rooms are enclosed by 13-in. brick walls carried to the under side of the roof girders.

The engine house proper is heated by hot air which is forced through a system of concrete and vitrified pipe ducts from the heating plant as shown on the plan. The air is heated by a group of 64 "Vento" steam radiators, and is then



Plan and Section of the Cinder Pit

forced through the ducts by two motor-driven multi-blade conoidal fans, each of which is of sufficient capacity to deliver 27,000 cu. ft. per min. Low pressure steam coils heat the office and storeroom. Steam for all purposes is furnished by two 200-hp. Murray horizontal water tube boilers. Ashes are discharged to a dump 150 ft. from the boilers through one of the American Steam Conveyor Corporation's special eight-inch cast iron pipe conveyors, operated by a steam jet. A 300-ton capacity coal bin is located in front of boilers and adjacent to the outside wall of building, convenient openings being provided for easy handling of coal.

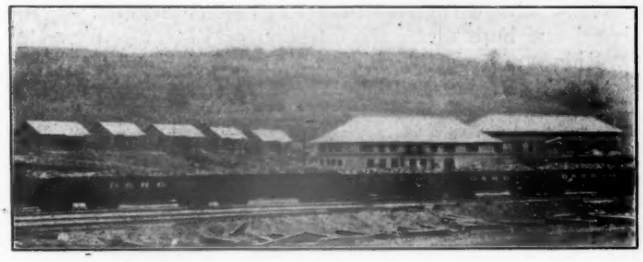
Steam, air and water mains, with laterals for each tier of engine pits, are carried overhead on brackets attached to the concrete columns with drop lines and service connections to serve all pits. A complete boiler washout system equipped with blow-off, wash-out and re-fill pipes and connections was furnished and installed by the Miller Heating Company. Tanks and pressure pumps are located in a separate building just east of the boiler room.

The engine house is lighted by 200-watt lamps suspended from the girders, all vertical and overhead conduits being imbedded in the concrete units. Extension cord sockets are provided in alternate columns.

Auxiliary Facilities

The coal chute is a standard incline wooden structure, provided with 10 coaling pockets, five on each side, having a total capacity of 300 tons. The chute proper is 80 ft. long, supported by 12-in. by 12-in. posts and sills on concrete footings. The incline trestle approach is 528 ft. long, built on a six-per cent grade. A tail trestle extends 80 ft. beyond the chute and under this a wet sand bin was built and supported by the framework of the trestle. The sand drying facilities consist of steam coils, over which the sand passes by gravity to steel drums buried in the ground from which it is forced by air to overhead storage bins.

The layout also includes a double-track concrete cinder pit designed for use with a steam jet pipe conveyor system of disposal. The pit proper is 8 ft. wide, 8 ft. deep and 30 ft. long, built between tracks 20 ft., center to center. This main pit is connected on either side with concrete hoppers, one under each track, which receive the cinders from the locomotive ash pans. A depression in the bottom of the pit contains an eight-inch cast iron conveyor pipe, with intake tees opposite the hoppers. This is carried through one end of the pit and thence underground for a distance of 175 ft. to discharge into the open air. At the opposite end of the pit the conveyor pipe terminates in an overhead line for depositing cinders in cars on an adjacent track. Steam, piped from the stationary boilers a distance of 500 ft. is used at a pressure of 80 to 120 lb. to operate the conveyor system.



Depot, Hotel and Group of Cottages

Because of the prevalence of heavy snow in the winter, a portion of two repair tracks is covered by a frame and corrugated iron structure, 44 ft. wide by 273 ft. long. The oil house is of frame and concrete construction, 26 ft. by 38 ft., with an unloading platform on one side and one end. The superstructure and roof are covered with corrugated galvanized iron. Seven oil storage tanks are located in a concrete cellar 10 ft. deep, while a gasoline tank is buried under the platform outside of the building. A 4-ft. by 4-ft. conduit for oil and heating pipes connects the cellar with the storeroom in the engine house. A complete oil distributing system, consisting of eight automatic self-registering pumps, located in the storeroom, together with fill boxes for barrel and car service and all requisite piping was furnished and installed by the S. F. Bowser Company.

At the summit of heavy grades, the testing of air brakes is particularly necessary, and therefore a brake testing plant with its distributing pipe lines through the yard was installed. Current for all power purposes and the lighting of the terminal is obtained from the Utah Light & Power Company, which has a nearby high voltage electric transmission line.

Water Supply.

Another most important engineering problem was the securing of an adequate water supply at a summit location of this character. This requirement was met by the fact that the Denver & Rio Grande held water rights at points along

the Price river. By obtaining authority to transfer the rights to divert water to one of its tributaries, the White river, a normal flow of adequate quantity was secured with an intake of sufficient head above the summit to obtain a gravity flow. This plan necessitated about 3¾ miles of 12-in. wooden stave pipe and a storage reservoir on high ground at the terminal.

Housing Accommodations

Not the least among the features of this project was the provision it was necessary to make for housing the employees and their families, for the surrounding country at Soldier Summit is uninhabited. Ten new six-room and 10 new four-room frame cottages were built for the use of the company employees and in addition a number of cottages from the old terminal at Helper were moved to new locations at Soldier Summit. In addition, a two-story frame hotel building was built in the shape of a "T" 130 ft. across the front and 85 ft. deep. All of the second floor and a part of the first floor is devoted to sleeping rooms and the remainder of the first floor to a lunch room, lobby, kitchen, etc. The map layout of the terminal also shows the location of a two-story frame station building affording space on the second floor for division offices. The hotel and station are heated by a steam-heating plant located in the small structure adjacent to the station. All of the housing buildings, including the employees' cottages, are equipped with modern sanitation for which it was necessary to provide a sewerage disposal system.

The yard and engine terminal at Soldier Summit was designed and built under the direction of J. G. Gwyn and A. O. Ridgway, assistant chief engineer of the Denver & Rio Grande.

Roads That Did Not Accept Six Months Guaranty

WASHINGTON, D. C.

THE LIST MADE public by the Interstate Commerce Commission on March 20 of the 864 companies, including railroads, steamship, bridge, terminal and depot companies, the Pullman Company and American Railway Express Company, that have filed with the commission an acceptance of the provisions of Section 209 of the transportation act, which entitles them to a six-months guaranty by the government but requires them to turn over any earnings in excess of the guaranty to the Treasury, shows that 41 Class I roads and large switching and terminal companies have decided to take their chances without a guaranty, hoping to earn more than the standard return based on the net operating income of the three years ending June 30, 1917. In addition about 100 of the smaller companies, out of the list of roads whose standard return has been certified to the President by the commision as shown by its last annual report, failed to file acceptances of the guaranty and a large number of other short line railroads are missing from the list, but in many cases it is understood that this resulted from a failure to act in time rather than from a deliberate intention to refuse the government's assistance.

According to the law, the acceptances were to be filed by March 15 and the commission on March 4 issued a notice, which was sent to 854 companies by telegraph, suggesting a form of acceptance and of a resolution to be adopted by the boards of directors authorizing the presidents of the various companies to execute the document.

The list of railroads that have accepted the guaranty includes several of the more prosperous companies that earned much more than their standard return in 1918 and 1919 and the list of those that did not accept also includes many that failed to earn their guaranty under federal control.

The Long Island on March 9 filed an acceptance and on March 15 revoked it. The principal companies that have indicated their intention of taking their own chances, together with the amount of the standard return which would have been guaranteed and the percentage of that amount which they earned in 1918 and 1919 is as follows:

	Standard Return	Percentage of Standard Return Earned in	
		1919.	1918.
Alabama Great Southern	$1,703,180	88	121.1
Atlantic & West Point	252,995	213.3	261.1
Atlantic City	222,066	336	458
Belt Railway of Chicago	869,442	186	181
Bessemer & Lake Erie	4,713,564	42.5	104.8
Birmingham Southern	138,815	16.8	223.0
Carolina, Clinchfield & Ohio	1,627,963	92	71.4
Cincinnati, New Orleans & Texas Pacific	3,541,040	14.9	87.3
Colorado & Wyoming	333,053	24.1	57.3
Cumberland Valley	1,228,967	36.4	150.4
Duluth & Iron Range	2,355,242	130.9	162.4
Duluth, Missabe & Northern	5,122,051	222.6	244
Duluth, Winnipeg & Pacific	357,136	39	60.9
Elgin, Joliet & Eastern	2,862,177	116.1	167
Fonda, Johnstown & Gloversville	359,583	105	89
Fort Smith & Western	80,499	300	232
Lake Superior & Ishpeming	150,880	187	331
Long Island	3,221,949	75.9	121.5
Louisiana & Arkansas	359,362	(def)	24
Monongahela Connecting	33,620	(def)	416
Montour	314,424	48.2	114
New Orleans & North Eastern	1,204,992	15.5	82.2
New York, Chicago & St. Louis	2,218,857	182.5	175.5
Newburgh & South Shore	75,831	(def)	286
Northwestern Pacific	1,338,000	82.5	111
Pere Marquette	3,748,196	179.2	10..8
Perkiomen	339,091	154	142
Philadelphia, Bethlehem & New England	102,022	(def)	121
Port Reading	236,454	227	208
Richmond, Fredericksburg & Potomac	1,136,974	243.1	266.1
St. Louis Southwestern	3,355,749	91.5	109.7
St. Louis Southwestern of Texas	555,165	(def)	(def)
South Buffalo	141,160	(def)	83.7
Southern	18,653,893	57.1	158.2
Spokane International	190,909	169	140
Union Railroad (Pa.)	1,370,290	30.4	106
Utah	105,425	459	560
Washington Southern	467,230	401.3	371.6
West Jersey & Seashore	952,682	1.3	(def)
Western Pacific	1,900,350	188.2	137.1
Western of Alabama	288,338	197.5	215.8

Some of the roads that earned much more than their guaranty in 1919, yet accepted the six-months guaranty, are: Detroit & Toledo Shore Line, that earned 200.8 per cent of its guaranty; Grand Trunk Western Lines, 214.6 per cent; Michigan Central, 210.7 per cent; Louisville, Henderson & St. Louis, 145.9 per cent; Yazoo & Mississippi Valley, 115.9 per cent, and Union Pacific, 139.8 per cent. The Southern is the only one of the larger systems that did not accept the guaranty.

Out of a total of 203 Class I roads and large switching and terminal companies whose standard return and net operating income for 1918 and 1919 are compared in a table compiled by the Bureau of Railway Economics, 52 companies earned more than the standard return for both years, while 151 companies earned less. The 52 companies earned 33.87 per cent more than their standard return, thereby contributing $110,825,671 toward making up the deficits of the 151 companies that earned 48.2 per cent or $718,676,092 less than their standard return. The 203 roads as a whole earned $607,850,421 or 33.4 per cent less than the standard return.

For 1919 there were 44 roads that earned more than their standard return by 35.8 per cent or $51,784,666, while 159 roads earned less than the standard return by $444,368,818 or 58.1 per cent.

For 1918 there were 76 roads that earned more than the standard return by $85,707,877, or 33.4 per cent, while 127 roads earned less than their standard return by $300,974,146, or 46.15 per cent.

URGES ALASKA LAND DEVELOPMENT.—Legislation to stimulate development of land adjacent to the Alaskan Railroad has been urged by Acting Secretary of the Interior Vogelsang in a letter to the Senate. The department, he said, is without funds to advise farmers and other settlers of opportunities along the railroad, although 1,000,000 acres of agricultural land near the railroad have been surveyed and townsites laid out.

I. C. C. Holds Hearing on Rate-Making Procedure

Property Investment Accounts Suggested as Temporary Basis of Value—Three Rate Groups Proposed

WASHINGTON, D. C.

THE FIRST RATE CASE under the new transportation act was initiated at a hearing before the Interstate Commerce Commission at Washington on Monday, March 22, and three days were devoted by the commission to hearing the views of the representatives of the railroad companies, the Association of Security Owners, shippers, state commissioners and organized employees as to the methods to be used by the commission in adjusting rates to produce the fair return required by the law.

The subjects for discussion at the hearing were: 1. Whether the rate adjustment shall be made for the carriers as a whole or by rate groups or territories, and if the latter, what rate groups should be designated by the commission. 2. What methods should now be employed for determining the aggregate value of the railway property of the carriers as a whole or in each of such rate groups or territories.

This was not the first hearing involving the prospect of a general increase in freight rates throughout the country, because the railroads had asked for such an increase in the 15 per cent case in 1917. Nor would the general increase expected be the first, because Director General McAdoo had made such an increase in 1918 without the formality of a hearing, but the proceeding was placed on a new plane both by the new conditions created by the transportation act and by the magnitude of the figures involved. While the prospective advance in rates on the basis of present figures may not be so large as that ordered by Director General McAdoo, the possibility that it might have to be enhanced before the matter is concluded was foreshadowed by the resumption of conferences on the same day between the committees representing the railroads and the employees whose wage demands are estimated at $1,100,000,000 a year. Moreover, the principal subject of discussion, the question of the value to be used as a basis for the 5½ or 6 per cent return allowed by the new law until the commission completes its valuation under the law of 1913, led the argument into the field of billions, whereas in previous rate cases most of the points of difference have been expressed in millions. On the question of the value of the railroads the extremes were represented by counsel for the employees' organizations that have adopted $12,000,000,000 as a maximum figure, although this figure was not mentioned at the hearing, and for the railroad executives, who contended that the full present value of the railroads would be at least 75 per cent above the book cost, which would produce a total somewhere around $35,000,000,000, although it was only asked that the book cost be taken as a minimum.

The attendance at the hearing was so great that even standing room was at a premium, and in order to limit the proceedings to the three days allotted it was necessary for the various groups of interests to pool their issues and select representatives to speak for them.

The representatives of the Association of Railway Executives and of the National Association of Owners of Railroad Securities suggested that the three present classification territories, eastern, western and southern, be designated as the rate groups and that the property investment accounts of the carriers be taken temporarily as the basis of value of the railway property, although the representatives of the executives referred to this as a minimum. The railroads in Southwestern territory asked that their lines be designated as a separate group, and a group of other lines asked that the Western roads be divided into three groups, one for Southwestern territory, one for what is known as Western Trunk Line territory, extending roughly to the Rocky Mountains, and one for transcontinental territory, including the lines from the Twin Cities to the Pacific Coast.

Donald R. Richberg, representing the railroad employees' organizations, took the position that the commission cannot comply with the requirement that it adjust rates to produce a return of 5½ to 6 per cent until it ascertains the actual value of the properties.

Representatives of the shippers and of the state railroad and utilities commissioners generally approved of the proposal that the three classification territories be taken, at least temporarily, as the rate groups, although there were several other suggestions, and most of the shippers' representatives who spoke regarded the temporary use of the property investment accounts, subject to modifications or corrections by the commission, as a fair, practicable basis. J. E. Benton, Washington representative of the National Association of Railway and Utilities Commissioners, however, attacked the investment accounts as worthless, unreliable and no evidence of either cost or value, and he insisted that the commission attempt to build up an aggregate value by the use of such data as is now available as the result of the work under the valuation act and by the consideration of all available information as the basis for an estimate.

In general, however, the atmosphere of the hearing was far less contentious than that of most of the former big rate cases and there was a more evident desire for co-operation on the part of all interests.

Railroad Credit Now Depends on Commission

S. Davies Warfield, president of the National Association of Owners of Railroad Securities, the first witness, said in part:

"Upon your decision in respect to the two fundamental questions arising in the administration of the transportation act rests the question as to whether the railroads of the country are to remain in private hands or through force of circumstances be acquired by the government. In your determination of these questions those owning the securities of the railroads have great concern. The act leaves to the commission two methods to be pursued in arriving at the aggregate fair value of the railroads upon which the percentage return shall be computed and rates made accordingly. This association advocated before the committees of Congress the grouping of the railroads that has been heretofore employed by the commission and that the present three classification territories, with perhaps some shifting of certain railroads from one territory to another, would be an equitable division, fair both to the shippers and the railroads. We can see no reason to change this position. When it comes to the ascertainment of the fair value of railroad property in the aggregate for rate-making, this reaches the root of railroad credit. We advocated before the committees of Congress the use of the only basis immediately available for computing the return from rates until replaced by actual valuations, and that is the property investment account of the railroads in the aggregate.

"It is not necessary to call to the attention of men of the great experience of those sitting on this commission the tremendous difficulties confronting the railroads in securing the funds upon which to continue their successful operation. We believe the public and the shippers fully appreciate these conditions, and we hope and believe they will co-operate to

relieve them. We will not go into the shortage of cars and engine power. This commission is conversant with the record. Nor will we enter into details with respect to the immense importance of the problem of financing at present through the sale of bonds or other railroad securities. The competition in the money market is too severe to admit of the present successful financing of the securities of any railroad. There has, therefore, been committed to this commission the greatest responsibility ever delegated to a governmental or regulatory body, for upon your decision and appreciation of the serious problems confronting the railroads depends their ability to move the products of the manufacturer and the field. The railroads cannot move them without credit, and credit will not be obtained without due regard for the requirements that give it."

Forney Johnston, counsel for the association, congratulated the commission and the transportation of the country on the added responsibility and authority conferred upon the Interstate Commerce Commission, "undiluted by any division of authority," and he expressed the utmost confidence that the purpose and object of Congress to sustain and make effective private ownership and avoid government ownership is to be carried out. "The battle of the Marne on the question of railway credit and government ownership has been fought and won," he said, "and the transportation act has been written around the necessity for greater revenue for credit and immediate stability." He also pointed out that the intensive survey resulting in the present act began with the President's message of December, 1915, urging a thorough survey to ascertain whether existing laws and their administration were as serviceable as they might be in enabling the railroads to perform the public service of transportation. The President's message led to the appointment of the Newlands committee, which continued its investigation until it was superseded by war and federal control, and by taking up its work the committees of Congress produced and Congress adopted the transportation act based on the necessity for increased and stabilized revenue.

Any standard of valuation less than the aggregate property investment accounts will be inadequate to restore credit, assure service and facilities and avoid government ownership, Mr. Johnston argued, and he laid much stress on the assertion that Congress had such a standard clearly in mind when it adopted the act. He asked that the uncorrected property investment account be used for what he called the interlocutory valuation, because it would be unfair to revise it downward because of conspicuous instances of overstatement without being able to revise it upward for the instances of understatement which are not so well known. If the commission should adopt an overcautious attitude the entire purpose of Congress would be thwarted, he said, because the property investment accounts and the fact that the standard return under the federal control act amounted to 5.22 per cent on that sum had been taken into consideration throughout the proceedings before the Congressional committees. Some members of the commission expressed some curiosity as to why Congress had not stated its intention to have the property accounts used if that had been its purpose instead of saying that they were to be given no more weight than they were entitled to, and when Mr. Johnston quoted a statement made by Commissioner Clark in reply to a question at the hearing before the House committee that he knew of no better available standard, Mr. Clark read the question to which he had replied, which referred to the use of these accounts "subject to review by the commission so it may eliminate improper items."

In reply to a question by Commissioner Aitchison as to whether the commission should not consider any other information, Mr. Johnston said that such results as the commission has already obtained from its valuation work must have demonstrated that the property investment account is not too high. Commissioner McChord asked what would happen if the commission should use a value of, say, $20,000,000,000 and the valuation should later show only $15,000,000,000. Mr. Johnston said that would be after the two-year period fixed by the law during which 5½ per cent is declared a fair return, and it would then be the duty of the commission to fix a rate of interest sufficient to sustain the credit of the carriers. He asked the commission to consider that there are many judicial questions yet to be settled which may affect the weight of the data gathered by the Bureau of Valuation, and that any doubt should now be resolved in favor of the public interest in adequate transportation facilities.

"I have a notion that neither the book value nor the valuation data are infallible," said Commissioner McChord, "but no one wants to do any harm. We recognize that the carriers must be financed and their credit maintained. I recognize that under the act of Congress there has been a complete reversal of ideas. The first thing to be done is to finance the carriers."

Commissioner Daniels asked why the capitalization of the standard return might not be an available standard. Mr. Johnston said that he had no doubt that the Senate had recognized the relation between the standard return and the property investment account and that Senator Cummins had stated that 5½ per cent upon the book value would represent an increase of about $50,000,000 above the standard return.

Basis of Value

The position of the Association of Railway Executives as to the basis of value to be used for the present was stated by Alfred P. Thom, counsel for the association, in a resolution adopted by the executives as follows:

"The problem before the commission is to determine in a summary way the aggregate value of all property held or used for the purpose of transportation in the several rate groups, the transportation act recognizing that the correct amount of such aggregate value cannot now be determined.

"In considering and determining the problem, the property investment accounts and the materials and supplies accounts in a given group are, in our judgment, admissible in evidence, and the carriers believe that these accounts for the several groups are the minimum conservative figures now susceptible of use, all other data and evidence being for the most part actually and in all cases legally incomplete and unfinished.

"In our judgment the property investment accounts should, under the law, be considered in connection with and supplemented by any other available evidence or data sufficiently complete and reasonably adequate for the purpose, but the basis of the value now arrived at should not be the incomplete data compiled in connection with the work of valuation now in progress under the federal valuation act, as it is important that the final valuation under that act should not be anticipated or prejudiced in this proceeding."

Benjamin Campbell, vice-president of the New York, New Haven & Hartford, expressed the view of the majority of the carriers in favor of the adoption of the three existing classification groupings at this time, so far as possible, in order that the groups and rates may be established as soon as possible. These territories have been recognized since 1887, he said, and represent comparatively little overlapping of railroads, whereas to subdivide them would require the breaking of lines of railroad and the separation of accounts.

Southwestern Lines Ask Separate Group

B. F. Bush, president of the Missouri Pacific, spoke as chairman of the Southwestern Railway Executives' Association formed at a recent conference of the Southwestern lines, at which it was decided that if practicable a further segregation should be made by putting the Southwestern lines into a statutory group for rate-making purposes, but that if this should be considered impracticable now the commission

should take into consideration the special needs of the Southwestern lines by granting them a higher level of rates than is accorded the western lines as a whole. The association includes the Missouri Pacific, Missouri, Kansas & Texas, St. Louis Southwestern, Kansas City Southern, Texas & Pacific, Gulf Coast Lines, San Antonio & Aransas Pass, San Antonio, Uvale & Gulf, Kansas City, Mexico & Orient, Louisiana & Arkansas, Missouri & North Arkansas, and Kansas, Oklahoma & Gulf.

Mr. Bush said he represented a group of carriers that are "attempting to realize a commercial profit from the sale of transportation in these days of the high cost of living," that it is the duty of the commission to assist in the financial rehabilitation of the systems of transportation and that this represents one of the most momentous tasks in the history of the country. Without the unlimited credit of the government, he said, the railroads would not have been able to meet the transportation needs of the country during the war. The new act gives the commission full power to allow adequate rates as well as to deal with such questions as those involved in discrimination and local conditions. Missouri, Arkansas, Oklahoma and Texas and that part of Louisiana west of the Mississippi river, because of their peculiar conditions, ought to be considered in a separate group. The railroads in this territory are mostly north and south lines and have varying operating and traffic conditions from the east and west lines to the north of them.

The southwestern lines form a natural group for the purpose of establishing a fair return, Mr. Bush said, and their distinct character had been recognized by the Railroad Administration when it created the Southwestern region. The rates in this territory have always been considered by themselves, and the shippers in the territory are not so much concerned with the measure of the rates as with the necessity for adequate transportation facilities. The territory is developing so rapidly in production that any increase in rates is inconsequential as compared with the loss suffered by inability to reach the markets, particularly in the case of food products, which are so badly needed. Mr. Bush also referred to the fact that 20,000 miles of railroad in the southwest have been in receiverships.

C. Haile, chief traffic officer of the Missouri, Kansas & Texas, testified regarding traffic conditions, saying that the southwestern lines had been treated as a separate group in the construction of rates for more than a generation. For the years 1915, 1916 and 1917, he said, 25 representative southwestern roads had earned an average of only 4.07 per cent.

Other Lines Propose Three Western Groups

Stanley H. Johnson, vice-president of the Chicago, Rock Island & Pacific, urged the division of the western lines into three groups, Southwestern territory, Western Trunk Line Committee territory and transcontinental or intermountain territory, which would include the Great Northern, Northern Pacific, and the Minneapolis, St. Paul & Sault Ste. Marie, except its Chicago line. He said he spoke on behalf of the Chicago & Northwestern; Chicago, Milwaukee & St. Paul; Chicago, Rock Island & Pacific; Illinois Central: Kansas City Southern; Missouri Pacific; St. Louis-San Francisco; Missouri, Kansas & Texas; Chicago & Alton; Minneapolis & St. Louis, and Elgin, Joliet & Eastern.

Mr. Johnson said that Western Trunk Line territory is just as distinct and well-recognized as the classification territories. If the country were to be divided into five rate-making groups, Official Classification territory would comprise about 61,000 miles of railroad, Southern Classification territory 42,000, Southwestern territory 37,000, Western Trunk Line territory 62,000, and the rest of the western territory, which might be called transcontinental and intermountain territory, 39,000. He said the proposed division of western territory corresponded to that accepted by the eastern and southern lines for a division of the territory east of the Mississippi river into eastern and southern territory. The majority of the western trunk lines, he said, believed it would be unfortunate and contrary to the spirit of the law to create one immense western group and make the far western lines earn more than they are entitled to, while withholding from the lines in the southwest and the trunk line group what they need. The spirit of the law is to make each railroad earn as near 5½ per cent as practicable. This is not practicable as to individual roads, but it would be practicable to apply it to the southwestern and western trunk line groups. The alleged difficulty of separating values, expense and earnings, he said, does not appear to be insurmountable. The Rock Island has many times met the same problem in proceedings before state commissions. If the plan should be adopted intra-territorial traffic would take the percentage of increase determined upon for the group and traffic between trunk line and transcontinental territory would take the percentage applied to the trunk lines.

Frank Lyon, appearing for the Northwestern Coal Dock Operators' Association, said his clients think the rates of the railroads serving the docks at Lake Superior are now fairly compensatory and that if they are not grouped with other roads the needs of the rest of the country can be taken care of without increasing their rates. Chairman Clark asked Mr. Lyon if he thought that was what the law contemplated. Mr. Lyon said he certainly thought it was the purpose of the commission under the law to decide how railroads should be grouped so as to require an approximately equal increase in rates, and he asked that no action be taken resulting in an increase in the rates of those roads beyond their needs.

S. T. Bledsoe, general counsel for the Atchison, Topeka & Santa Fe, said that the segregation of the western trunk lines and southwestern lines would present so many complications in the segregation of values, revenues and expenses as to make the plan impracticable of accomplishment in time to make the needed increase in rates, because it would cut practically every railroad of importance into two or three parts, and the commission has no records of the value, revenues or expenses of the several parts. The commission need not, however, he said, increase all rates in a group by the same percentage, but can take into consideration differences in the condition of carriers in parts of a group and could apply a separate percentage to the southwestern and western trunk line territories much more satisfactorily than it could establish them as separate groups. He agreed with what had been said regarding the needs of the southwest, in which the Santa Fe has 4,000 miles of line, and thought that territory needs an increase substantially greater than the average for the rest of the western territory.

Property Investment Account Called Conservative.

Alfred P. Thom, counsel for the Association of Railway Executives, referred to Chairman Clark's remark at the opening of the hearing that the owners and operators of the railroads were to be heard. He said that the executives "derive their authority from the stockholders and represent the stock ownership of the properties." He argued that the act lays upon the commission an imperative obligation to adjust rates to produce the fair return prescribed, that it is cautionary in saying the commission shall give the property investment account only such consideration as it is entitled to and is permissive in saying the commission may utilize the results of its valuation work so far as available. He believed it had been universally conceded that the property investment account is legal evidence and must be considered, and as to its probative force it is known that about 35 per cent of it had been constructed under the supervision and rules of the Interstate Commerce Commission since 1907.

Mr. Thom also pointed out that from 1892 to 1906 the

investment reported per mile had been reduced from $59,675 to $59,624 and in 1896 had reached its lowest point at about $54,000, whereas $12,686 per mile had been added from 1907 to 1917. From this, he said, the conclusion is justified that during the 14 years from 1892 to 1906, when many railroads were undergoing reorganization, was a period of elimination of amounts that might be criticized. Much of what is called "water" disappeared in the process of readjustment and large amounts were charged to operating expenses instead of to capital account. To the cost of road and equipment must be added the working capital, amounting to about $500,000,000, Mr. Thom said, and Director Prouty of the Bureau of Valuation has also said that about 7½ per cent should be added as going concern value. Moreover, if the commission had the time it would be its duty to find the present value of the railroad properties, as held by an unbroken line of decisions of the Supreme Court, and this would allow a margin of at least 75 per cent because of the greatly increased value of the railroad property at the present time.

"Rates are paid now in a depreciated dollar," said Mr. Thom, "and the number of dollars of revenue cannot be determined on the basis of the dollars of 1913 and 1914. The principal must be expressed in the same kind of dollars as the revenue.

"Your inquiry and your duty is to find what would be the cost of duplicating these properties and the fact that you must do it by a summary method does not affect your duty. Add that consideration to the property investment account and make allowance for the growth in value since the property accounts were written on the books and you will have more than enough to cover any errors of overstatement there may be. The property account represents only the cost of construction and the increase in value has more than absorbed every error and more than corrected every overstatement there may be in the accounts.

"The aggregate investment account therefore represents the minimum. If you had the time it would be your duty to look into the increase and add that."

Mr. Thom also said that the property accounts may be checked by the earning capacity of the roads, inasmuch as the commission had recommended to Congress that the existing rates be recognized by law as fair and reasonable and the earnings of the carriers during the test period were endorsed by Congress as the fair figure to be paid by the government as rental. Capitalizing the $935,000,000 of standard return at 5½ per cent, he said, gives $17,000,000,000 and $1,500,000,000 additional has been put into the properties since June 30, 1917, making a total of $18,500,000,000 as a check against the property account. If the commission should reduce the basis of value it would reverse the basis on which the financial structure is based. In reply to questions by the commissioners he said that if as to any property or group the valuation has been sufficiently advanced that it is in the opinion of the commission available for use how it may be used but the book value is complete and is sufficiently conservative to be used in the aggregate without correction, although the commission may take other things into consideration.

Donald R. Richberg, representing employees, said he spoke for a law-abiding and law-respecting class of citizens that want the law enforced just as it was written and that the property investment account can only be entitled to minor consideration. He said the employees are interested in rates being sufficient to pay living wages and to attract the men necessary to operate the railroads and are not interested in starving the roads, but objected to any excessive capital charge that will make it impossible to pay adequate wages. He said that railroad wages are now so insufficient that many men are leaving the service. He said it was a matter of common knowledge that the property investment account does not represent value, but has been built up in such a way as to represent liabilities rather than assets and it is the duty of the commission under the act to make a valuation prior to making rates.

State Commissions Object to Investment Accounts

J. E. Benton said that a large number of the state commissioners had held conferences and that most of them were in favor of using the three classification groups, but that they were in no contentious attitude. He read a telegram from the Nevada commission asking that no groups be established but that railroads be considered as a whole and asking that there be no horizontal increase in rates. Mr. Benton said that a valuation on the basis of the investment accounts as they appear in the books is explicitly forbidden by the law and that these accounts are utterly worthless as evidence of value or of investment. The commission should consider them as of weight only to the extent that they represent actual investment. The law, he said, has commanded the commission to do what it is impossible to do in any brief time but the commission must do the best it can by adopting some common sense method of considering all the elements of value of which it has information or can get information in a reasonable time. He suggested that the commission create a subordinate board to build up a valuation from such data as is in its possession, supplemented by estimates that can be made from the known facts. The purpose of Congress is reflected, Mr. Benton said, in what is said in the act rather than in what Mr. Johnson says that some committee or Senators had in mind and he had too much respect for the Senate to believe it was afraid to say in the law what it wanted to, but had sent Mr. Johnson to "the other end of the avenue" to tell the commission what it really meant.

Commissioner Aitchison read from a statement by the House conferees saying that the bill had been written in such a way as to direct the commission "not to give undue consideration" to the property accounts.

E. R. Stewart, of the Michigan Public Utilities Commission, said he might want to be heard later on the question of grouping because Michigan is now divided between Official and Western Classification territories and now has eight different bases of rate-making. "We are proud of the way we have treated the carriers," he said, "and of the showing that they have made, because 6 of the 14 roads in the eastern region that earned their guaranty last year served the state of Michigan."

Fred Putnam of the Minnesota Commission spoke for a group of states including Iowa, Minnesota and the Dakotas, suggesting that for the present the three classification groups be used. He said that it might give some advantage to the territory for which he was speaking if the Southwestern roads were grouped separately because the Northern roads are more prosperous and if the commission thinks it is necessary to segregate them in order to give them certain roads proper consideration there will be no objection. "We appreciate," he said, "that some roads need special consideration and we consider it important that the railroads be in good financial condition in order that they may be enabled to serve the public."

A. E. Helm, of the Kansas Commission, said that the groups should be arranged to make the commission's task as light as possible and although more than three might be desirable, the existing classification territories would maintain existing relations. Kansas and several other states, he said, would not object to a division of the West into three groups as suggested by Mr. Johnson, but they are more interested in the rate adjustment that shall be made within the districts.

Bird M. Robinson, president of the American Short Line Railroad Association, gave the results of the latest investigation as to the number and mileage of short line railroads. He said there are 605 standard gage roads of less than 100

miles, making a total of 16,343 miles; 55 roads over 100 miles with a total of 11,924 miles; 97 electric roads doing a substantial freight business with a total of 6,663 miles, and 47 narrow gage roads with a total of 1,499 miles, making a total of 804 roads classed as short lines, operating 36,429 miles. Mr. Robinson said that the short lines include many that are "short in revenue" rather than in mileage and range up to 450 miles in length. They represent an important part of the transportation system of the country and the law recognizes them as such. The commission is charged with the duty of looking after their welfare and should allow full value on all these properties as any one who tries to hold down the basis of value is tending to limit the facilities of transportation. Mr. Robinson described some experiences of his own in building short line railroads which immediately produced a very large increase in the value of the adjacent land, but which had invariably met complaints from the newly located shippers that the rates were too high to enable them to earn a fair return on their investment. As a result, he said, rates had frequently been reduced in spite of the fact that one road of 400 miles has never paid a cent on its stock and another road of 62 miles has never paid interest on its bonds, although it has increased the value of adjacent land from $1 to $200 an acre. Mr. Robinson said that he claimed the law allows a 5½ per cent return on each railroad because in fixing divisions the commission is directed to take into consideration all expenses plus a fair return and a fair return is defined in the act as 5½ per cent. If the commission cannot so adjust rates as to give this return, he said, it should give the railroad a certificate under which it can be abandoned. Mr. Robinson said he saw no other available basis of value except the book investment. A capitalization of the standard return would not be advisable because many railroads had no standard return, yet they had property. It is the commission's duty, Mr. Robinson urged, to allow the carriers such revenue as will make the transportation system of the United States the greatest and best in the world. If it attempts to limit value the result will be disastrous.

Testimony of Shippers

C. E. Elmquist, representing the Northern Pine Association, said that the railroads had insisted that private operation would be more economical than government operation and that they should be taken at their word. He believed they could produce economies but that the burden is upon the carriers and not upon the shippers to prove it. He suggested that the commission send a questionnaire to the railroads asking them to show by August 1 what economies they can put into effect, such as by reduction of the number of employees or by a readjustment of wages, and that the commission should consider the opportunities for economy before it considers a rate increase. On the question of value, he said $16,000,000 of the public money has been expended by the commission on valuation, that Director Prouty says that by the end of 1921 he will have all the information for railroads over 500 miles and that it is absurd to say that Congress should not have contemplated that the commission use this data.

G. M. Freer, executive secretary of the National Industrial Traffic League, said that at a meeting of the league in St. Louis last week it had been decided that for the present the commission should recognize the three classification groups and that if it is able to determine the value of any carrier from the data in its possession that should be used, but where it is not available the commission should use the property investment accounts, subject to such modification as the commission sees fit to make based on all data available to it, but eliminating all items that do not represent railway property held for the purpose of transportation. Several other representatives of shippers endorsed this position and said it would not be necessary to discuss the matter further.

Shippers Want Service

E. J. Rich, representing New England shippers, advocated the use of the three classification groups on the ground that the law recognizes that transportation is national and that each section of the country contributes to the support of railroads in other sections. "Some of us," he said, "have grave doubts as to whether the transportation problem can be solved on the valuation theory. If the valuation is in excess of the capitalization the people will be called on to pay more than is necessary and if the valuation is below the capitalization the railroads will not get enough." He did not see how the commission can do anything else than determine a value for each road and take the aggregate, but the commission in fixing the value should have in mind the supreme necessity of sustaining the credit of the railroads because the one thing the shippers want is service. He objected to what he termed the claim of the railroads that value should be based on the cost of reproduction, but he wanted the commission to take a liberal view of value so far as it can within the terms of the act.

J. Van Norman, representing the Southern Hardwood Traffic Association and Kentucky shippers, said that the commission should consider the railroads as a whole or divide them into a very few great divisions, such as the three that had been suggested. If there are any burdens to be borne they should be distributed along national lines. The shippers, he said, know very little about the state of the valuation proceedings and believe that it is incumbent upon the commission to make the best estimate possible.

C. E. Cotterill, representing the Southern Traffic League, said that the shippers in the South have come to the view that they should not adopt a cheese-paring policy with the railroads and that unless the railroads are deprived of the opportunity to "yell poverty" as they have in the last few years the only alternative is government ownership. He said the country should be divided into the three classification groups, but that it was "rather unbecoming" of the railroads not to include the Norfolk & Western and the Chesapeake & Ohio, two of the strongest lines, in the Southern group. Temporarily, he said, the property investment account probably affords the closest available basis of valuation.

W. S. Prickett, representing Salt Lake City and Utah shippers, spoke in favor the division of Western Classification territory into three groups.

F. A. Jones, of the Arizona Commission, also representing the New Mexico commission and the Intermediate Rate Association, objected to the use of the property investment accounts and said he did not object to three large rate groups, but thought that Western Classification territory might well be sub-divided. In that case, he said, it should be divided by a north and south line which would divide the United States into four approximately equal districts.

S. J. Wettrick, representing the Seattle Chamber of Commerce and the Seattle Commercial Club, suggested three rate groups and said that the people are more interested in service than in rates.

A. H. Brown, of the Cleveland Chamber of Commerce, suggested the retention of the Central Freight Association, Trunk Line and New England territories and said that if the book value were used it should be without prejudice and subject to all deductions the commission thinks proper.

George N. Brown, speaking for the Texas Industrial Traffic League, urged the necessity of dealing with the question in a broad way and promptly. He said that Congress had primarily directed the commission to give the railroads 5½ per cent, but had directed it to fix the rate groups from time to time. If groups are to be established, he said, the line of least resistance should be followed and it might be well to adopt the three groups for the present, but railroads are national and not local and there is no justification for the sep-

aration of the "goats from the sheep." Some railroads and shippers, he said, seem to want to group the needy railroads by themselves and the prosperous by themselves, but the commission should mingle the healthy and the weak.

S. H. Cowan, representing the Texas cattle raisers, said that if he were on the commission he would try to make interstate rates in such a way as to produce "about 5½ per cent if the states made their rates right." He would not state the value but would try to make the rates "about right" and "let the gentlemen help themselves to the mustard." He said that the railroads have more traffic than they can handle now and if they cannot make money out of it the commission is not required to take into consideration a railroad that is not honestly and efficiently managed. He said there was no reason for the creation of a Southwestern group unless it is because the Southwestern roads want a larger increase in rates.

Clifford Thorne made a characteristic attack on the arguments presented on behalf of the railroads and of the security owners, whom he persisted in confusing in his remarks. He said no one can question the fact that certain principles must be considered if the commission's conclusions are to have any standing and he attacked the property investment accounts as worthless. Mr. Thorne said the shippers do not oppose advances in rates, but it is their purpose to see that the foundation is not made for an excessive increase and he pointed out that the 25 per cent increase which it is currently stated the railroads expect would amount to more than $1,000,000,000 if applied to both freight and passenger traffic and to $889,000,000 if applied to the freight alone. Mr. Thorne had hardly begun his remarks when both Luther M. Walter and Alfred P. Thom insisted that he had misquoted them by attributing to the security owners the position taken by the railroad executives and to the carriers' statements made by counsel for the security owners. Mr. Thorne said he would substitute "counsel for the carriers" where he had used Mr. Thom's name, but Mr. Thom said that he was the only counsel for carriers that had yet spoken. Mr. Thorne then used the term "counsel for the security owners and carriers." Mr. Thorne said the railroads have never revised their property accounts downward for the period prior to 1907 when the commission began supervising them and he cited numerous notorious cases where overstatements of the property accounts have been brought out in various investigations. He also objected because these accounts include improvements made out of earnings. He also cited figures for 1917 to show that the property investment account then was "two thousand million dollars greater than the capitalization." Mr. Thorne also answered various "claims" which he said had been made by counsel for the carriers and the security owners, which they later said they had not made. He declared that the value should not be determined on the basis of the present abnormal prices and that the commission should not adopt any single factor but consider all the elements of value. He suggested the possibility of capitalizing the standard return and adding the additions and improvements made by the railroads since July 1, 1918.

E. V. Dabney, representing the International & Great Northern, said that every one knows that the property investment accounts include many discrepancies and some unjustifiable items, but he argued that such errors are much more than offset by understatements and the fact that the cost of reproducing the railroads greatly exceeds the property accounts.

Luther M. Walter presented a brief concluding argument for the association of security owners, saying it would be short-sighted to ask the commission to adopt any rule of thumb method in view of all the information it has gathered and that it should avail itself of any information which it considered available. He said the interests he represents are confident that the commission will rise to the occasion and give the carriers a fair return on a fair value. This could be done by using the property investment accounts supplemented by such other information as the commission might have and he pointed out that the excess earnings rule of the law would bring back part of the money that might be paid to the carriers.

E. G. Buckland, speaking in behalf of the New York, New Haven & Hartford, the Central of New England, the Rutland, the Maine Central and the Bangor & Aroostook, said that those roads would be willing to co-operate with the commission in using the data collected by the Bureau of Valuation. Commissioner Eastman asked if he thought the data already collected as to the New England roads would lead to a higher value than the property investment account. Mr. Buckland said he thought it would represent a truer value.

S. T. Bledsoe, speaking for the Association of Railway executives, said the association does not want to be put in the position of asking the commission to exclude anything that in its judgment fairly and reasonbly tends to indicate the value. He did not believe the commission can within the rules of evidence determine the value of these properties in the time allowed. It must approximate that value as nearly as it can. The investment accounts have their weaknesses and no one contends they are perfect, but he thought that if eliminations were made for the flagrant cases of overstatement they would not amount to more than 2 per cent of the total. He said the statute gives no evidentiary value to the valuation data until it is completed. He said the carriers did not wish to insist on that point but that he had made that statement in reply to Mr. Benton's argument. He said the Supreme Court had held repeatedly that the present value must be taken into consideration, but that the railroads have not at this time tried to stand on their constitutional rights and invoke the principle of present value, but had suggested the use of the book value, knowing that it was conservative as compared with the present value.

F. H. Wood of the Southern Pacific, also speaking for the Association of Railway Executives, pointed out that the determination of a temporary value is but the first step to be taken by the commission in the exercise of its new duty and that the most important step involves the adjustment of the rates. He said the statute contemplates that the rates shall be readjusted after the expiration of the six months' guaranty and that the sooner that is accomplished the sooner the carriers may begin to obtain new capital to make the necessary improvements. It is, therefore, necessary to act promptly in the public interest and to relieve the burden upon the Treasury as soon as possible. Additions and improvements cannot be financed until the rates are readjusted. He suggested that the commission arrive at a round sum which in its judgment represents a conservative figure which may be stated for the purpose of this proceeding and that the property investment account represents a minimum conservative figure. The carriers do not ask the commission to take this figure blindly and ignore any other information it has, nor to take it because it is the property investment account, but because it is now available and fairly conservative. To try to build up a value by taking such information as is available as to individual roads, he said, would be unfair and unjust. The commission must use its best judgment and he did not think that anything is conclusive on the commission in this matter. The cost of road and equipment accounts, Mr. Wood said, amount to less than the present value of the land alone.

RATES AND DEFICITS.—It is incomparably better, from the point of view of business ethics, to have high rates and to have the roads paying their own way, than to have low rates and to have the roads running behind and showing deficits every month. —*Harvey's Weekly.*

New Coaches for Metropolitan Railway of London

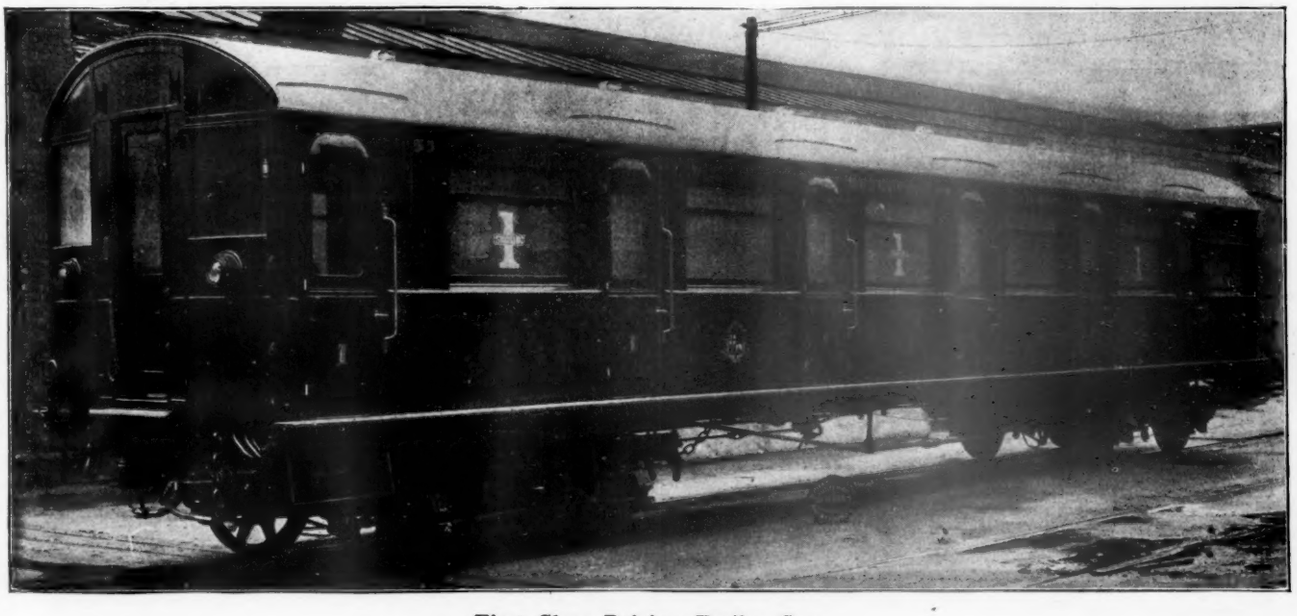
Conditions on a Congested Line Operating Forty Trains an Hour Demand Unique Type of Rolling Stock

By Frederick C. Coleman

THE METROPOLITAN RAILWAY owns or is responsible for the operation of about 88 miles of line in and around London. Of this mileage 36 miles are operated electrically and the remainder by steam. The lines comprise the major part of the inner circle, that is, from South Kensington to Aldgate, the lines from Baker street to Harrow, from Harrow to Uxbridge, from Harrow through Aylesbury to Verney Junction, the branch from Chalfont to Chesham, and the branch from Quainton Road to Brill; the city lines, which are owned jointly with the District Company, between Aldgate and Mansion House; the Hammersmith and City Line, which is owned jointly with the Great Western Company; the East London Railway, in which there are several other railway companies as partners; and the Great Northern and City Tube Railway, which is owned and operated by the Metropolitan Company.

The Metropolitan is at present working under British government control in the same way as the majority of other English, Scottish and Welsh railway companies. The company is entirely independent of the underground combine, but works in conjunction with that system and has a comprehensive arrangement for through bookings. It deals with heavy freight traffic on various parts of its system, and has junctions with the London & North Western, the Great Western, the Midland, the Great Northern, the Great Central, and the South Eastern & Chatham for the exchange of traffic.

A comparison of the rolling stock and the seating capacity during the years 1913-1918, and also during the past summer, shows that in 1913 there were 78 passenger vehicles, with a total seating capacity of 4,814, in service for steam operation; in 1918 and 1919, 76 passenger vehicles for steam operation, with a seating capacity of 4,544, were in service. In 1913 there were 453 passenger vehicles in service for electric operation, these having a total seating capacity of 23,498. In 1918 the number of these coaches was increased to 489 and the total seating capacity to 24,854, while last year there were in service for electric operation 509 passenger vehicles, with a total seating capacity of 25,734. The total number of passengers carried in 1913 was 121,593,861, the average number of passengers per vehicle being 228,990, and the average number of passengers per seat 4,295. In 1918 the total number of passengers carried was 159,272,202, the average number of passengers per vehicle being 281,900, and the average number of passengers per seat 5,418. In 1919 it is estimated that the total number of passengers carried by the Metropolitan Railway (London) was 181,734,800, giving an average number of pasengers per vehicle of 310,658, and an average number of passengers per seat of 6,002. As compared with 1913 there was a 49 per cent increase in the number of passengers carried during 1919, and a 36 per cent increase in the average number of passengers carried per vehicle, with a 40 per cent increase in the average number of passengers per seat.



First Class Driving Trailer Car

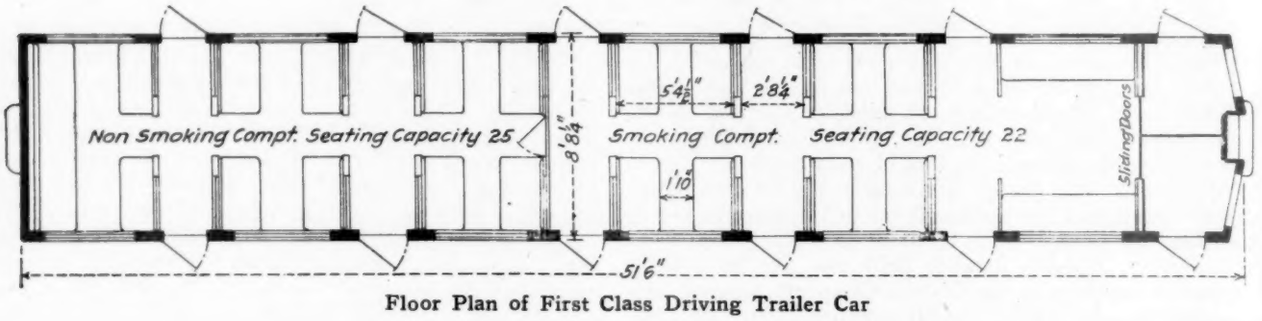
The train and car miles run during 1913 by steam trains was 961,629, and by electric trains 5,731,601. In 1918 the train and car miles by steam trains were 855,602, and by electric trains 4,923,253, while last year it is estimated that the train and car miles were 995,234, and by electric trains 5,471,315. The car and coach miles (electric traction) were 22,758,179 in 1913; 21,302,469 in 1918, and 22,657,432 in 1919.

Since 1913 the traffic over the whole of the Metropolitan system, particularly the electrified part of the line, has very largely increased, and this increase has been most marked since the signing of the armistice. It is not possible to give exact figures as to the passengers carried in recent years, as under the system of government control records of through passengers have not in all cases been kept, but very near

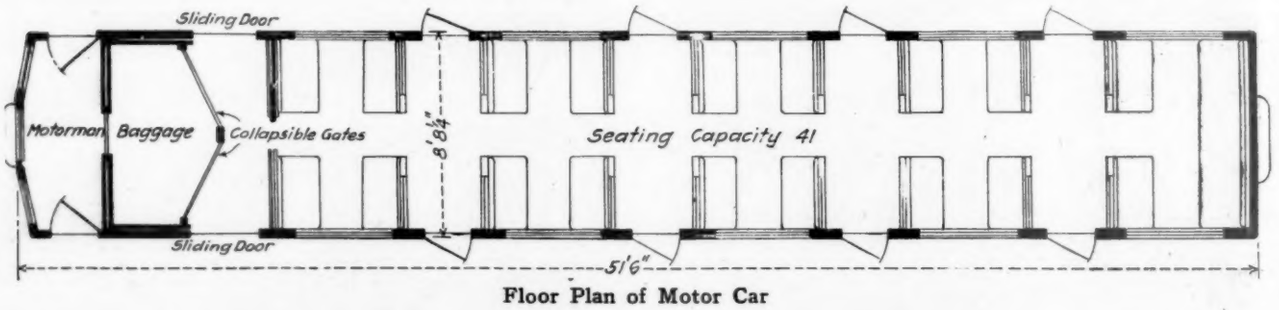
estimates have been prepared, and these show that compared with the passengers carried in 1913, which amounted to approximately 122,000,000, the number carried in 1918 was 160,000,000, and for 1919, based on the first three months, will be 182,000,000. It will thus be seen that the traffic at the present time shows an increase of 49 per cent over that of 1913, and this is without taking into account naval, military and other government traffic where the men do not take ordinary tickets. In normal times this large growth of traffic would have been met by an increase in the rolling stock, but during the war it has been impossible to get any such equipment constructed. The company was fortunate in being able to get delivery, in the early part of hostilities, of some new rolling stock that had been ordered previously, and has recently further supplemented this by borrowing two trains from one of the main line companies, which increased the number of passenger vehicles from 531 in 1913 to 585 last summer, but the increase of 10 per cent thus obtained goes a very small way towards meeting the increase of 49 per cent in traffic. The average number of passengers carried per seat has increased from 4,295 in 1913 to 6,002 at the present time —an increase of 40 per cent. The whole of the company's rolling stock is in use, and it is only with the greatest difficulty that opportunity is found to take trains into the shop for necessary overhauling and repairs.

The schedule to which the Metropolitan company is working requires that every train be put through the shops once in every 3¼ years for complete overhauling, and while it is considered essential for every train to have one day in every seven as a "shed day" for examination purposes, this schedule has recently had to be reduced to one "shed day" in ten, owing to the exigencies of traffic.

During recent months it has been necessary, in order to relieve the congestion of traffic, still further to reduce the schedule for "shed day" and emergency purposes and to bring into regular service as a temporary measure, and until new rolling stock can be obtained, several of these trains. It is being done at a distinct risk to the regularity of the service, but it appears to be necessitated by circumstances. When it is borne in mind that a train working on the Inner Circle service stops and restarts on an average of no fewer than 486 times in the course of its day's work, in addition to any signal stops there may be between stations, it will be realized how great is the strain both on the trains and on their electrical equipment, and how necessary it is that they should be subject to frequent examination and kept in thorough repair if failures are to be avoided.

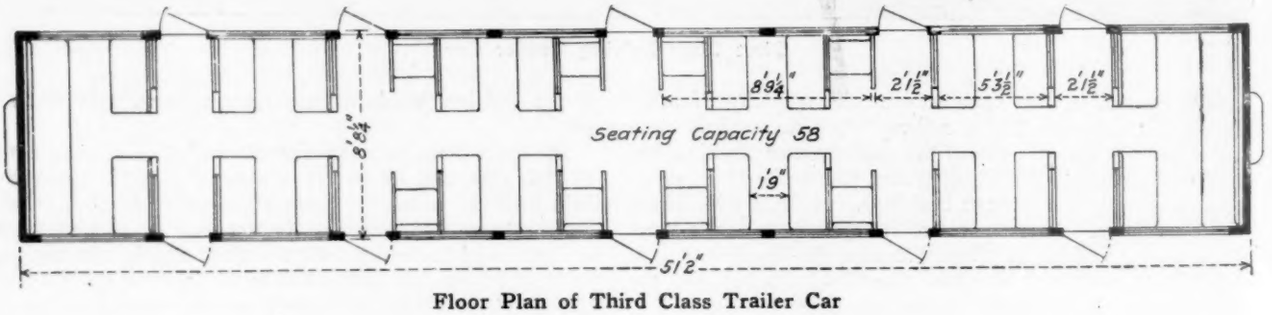


Floor Plan of First Class Driving Trailer Car



Floor Plan of Motor Car

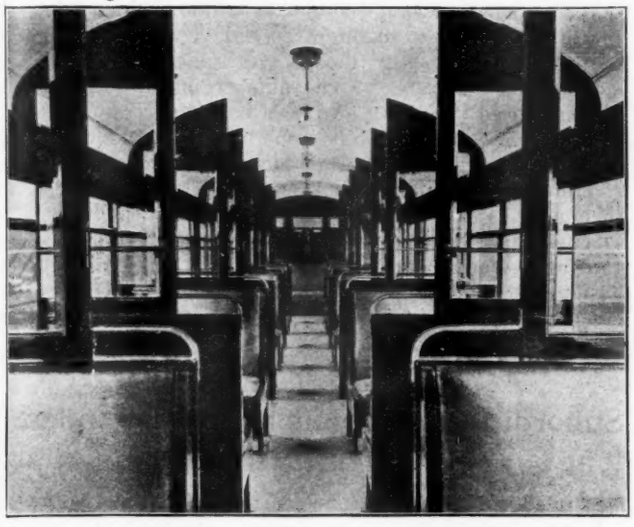
Mention should be made here that the Metropolitan company is at a distinct disadvantage through having several types of electrical equipment. This was brought about, to some extent, by the working arrangements with other companies and by the Metropolitan having taken over another line, including its rolling stock. If the whole of the equipment were interchangeable it would be possible to reduce considerably the margin allowed for emergency purposes.



Floor Plan of Third Class Trailer Car

It is of interest to note that for the 28 days ending May 24

last, out of a total train mileage of 387,280 miles run on the electrified section of the line, the failures were only at the rate of 1.4 per day, equal to one for every 9,880 miles run. The small number of failures is attributed to the company having been able to keep up so nearly to the schedule of maintenance, and it is pointed out that in the case of a traffic as



Interior of Third Class Trailer Car

dense as that on the Metropolitan line the absence of failures and the consequent regularity of service are the principal features in the prevention of congestion and overcrowding.

Automatic signalling is in use on the Metropolitan system, and the sections have been cut down to the shortest limit in order to avoid congestion at the busiest hours and to get as many trains as possible over the line. The maximum number per hour over the busiest section, i. e., between Baker street and Moorgate street, is 39, and while it might be possible to increase this number under more favorable working conditions it is almost impossible to do so with the present type of trains. As to the length of the trains, this is varied at different times of the day and on different sections of the line, according to the traffic to be carried, and varies from seven cars to three, the standard unit being six cars.

The operation of a railway like the Metropolitan, carrying a service between Baker street and Aldgate in excess of a tube service, is much more difficult than on a single route line such as a tube owing to the numerous converging services. For instance, between Hammersmith and Aldgate there are eight junctions where trains either cross or are imposed on to the running lines.

The overcrowding in the trains during the rush hours, morning and evening, can only be met by running a number of additional trains and by increasing those at present scheduled.

The improvement of the facilities for entraining and detraining passengers is of equal importance to the provision of additional stock. It is necessary that the station stop at any point should not exceed 25 seconds if the maximum service, i. e., 40 trains per hour, is to be attained.

When the pressure of traffic causes the station stop at any point to exceed this figure the number of trains per hour falls in proportion thus:

25 seconds stop = 40 trains per hour, or 1 per 90 seconds.
40 seconds stop = 35 trains per hour, or 1 per 105 seconds.
55 seconds stop = 30 trains per hour, or 1 per 120 seconds.

The increase of the station stop from an average of 25 seconds to 55 seconds means 10 fewer trains per hour passing, or a reduction of 25 per cent, in carrying capacity.

The Metropolitan Railway has had this problem under careful consideration for some time past, with the result that a type of train has been evolved which it is anticipated—however congested the traffic may be—will complete its station work considerably under 25 seconds.

This new train, illustrated in the accompanying drawings and photographs, represents the first instalment of an order placed by the Metropolitan Railway Company with the Metropolitan Carriage, Wagon & Finance Co., Ltd., of Saltley, Birmingham, England. Each train consists of a motor car, 51 ft. 6 in. long over end posts, with a seating capacity of 41 passengers; a third-class trailer car, 50 ft. 6 in. long, with a seating capacity of 58 passengers, and a first-class driving trailer car, 51 ft. 6 in. in length, with a seating capa-

The Third Class Trailer Car

city for 47 passengers. The total seating capacity of these three coaches is 146, and when working as a six-vehicle train, as they frequently are, the seating capacity is 292, as against 268 seats in a train of the older types of electric rolling stock. The feature of the new vehicles is the provision of five swing doors on each side of the cars in place of the two or three sliding doors now most generally used on electric railway rolling stock, and it is confidently expected that there will be a considerable improvement in entraining and detraining facilities. The underframes and trucks are identical with the existing coaches of the Metropolitan railway, the wheels having a diameter of 3 ft. 2 in., while the truck wheel base is 7 ft. The new door and seating arrangements allow of improved circulation inside the cars; the inconvenience occasioned, with previous designs, to seated passengers by others entering and leaving is now eliminated, all gangways being entirely unimpeded. Attention has also been paid to the improvement of lighting and heating and the provision of ventilation without draughts. A graceful dome roof has been provided and a "softening" of the lights obtained by the use of frosted bulbs and opal reflectors. The new system of

Non-Smoking Compartment of First Class Trailer Car

switching enables the guard to control the lighting throughout the train, thus saving delays now inevitable owing to independent car-light switching.

A great point achieved in the new train is the elimination of straphanging, "steadying" rails being arranged to provide a hold for passengers, so that while some standing will still be inevitable during the rush hours, passengers, and especially those of short stature, will be in a normal position.

The side doors adopted are of the Metropolitan company's standard type as fitted to compartment cars, but by means of spring buffers and strengthening of the longitudinal framing, door-controlling straps have been eliminated, as also have window straps on the third-class coaches. A new form of lock has been fitted, which, while being very easily operated, is provided with a special catch, thus providing an additional safeguard.

To add to the facilities for quick entraining and detraining on the motor cars, arrangements have been made to allow passengers to use the luggage compartment doors. The actual luggage compartments are enclosed by Bostwick sliding lattice gates, which should also reduce pilfering of small articles, everything being within open view.

Although the end door has been dispensed with, special handles have been provided to enable guards to pass from one car to another in cases of emergency, while step-irons have also been provided for safely alighting on the track when necessary.

Various improvements have also been made for the safety and convenience of the traveling public by the provision of an improved device for controlling the "trip" for actuating the brakes in emergency, and automatic window wipers to enable the driver always to maintain a clear view. The improved buffing and draw gear should give smoother starting and stopping of the train. Route number indicators of a new and improved type have also been embodied.

While everything has been done to promote the comfort of the passenger, that of the staff has not been overlooked, and comfortable, well-upholstered seats have been provided for their use.

These new vehicles have been built by the Metropolitan Carriage, Wagon and Finance Co., Ltd., according to the designs and under the direction of C. Jones of Neasden, the chief electrical and locomotive engineer of the Metropolitan Railway Company, London.

Subordinate Officials and Independent Organizations Recognized

THE INTERSTATE COMMERCE COMMISSION on March 23 issued supplemental regulations governing the making and offering of nominations for appointment of members of the Railroad Labor Board, placing various organizations of subordinate officials and of employees together in a special group for the making of nominations.

By reason of the fact that the law contemplated the making of nominations and offering of nominees in accordance with the regulations of the commission, within 30 days after the passage of the act, the commission had prescribed regulations with a view to the most expeditious making and offering to the President of nominations representative of the great bulk of those to be represented by the labor group. It is of opinion that the intent and purpose of the act is that the three members of the labor board representing the labor group shall be primarily representative of the rank and file of the employees. It was and is of the opinion that the overwhelming majority of those to be represented by the labor group are members of or represented through the organizations of employees named and grouped in its regulations of March 8, 1920.

Since the issuance of these regulations, however, representation as to their right to nominate members of the labor group has been made to the commission by certain organizations whose members are not, in certain cases, members of the organizations named in those regulations. These representations include certain employees of sleeping-car companies.

"It is to be observed," the commission says, "that the three members constituting the labor group are to represent the employees and subordinates officials of the carriers, and that from not less than six months these nominations are to be made and offered by such employees in such manner as the commission shall by regulation prescribe.

"According to the literal wording of the above paragraph, the three members constituting the labor group are to represent both the employees and subordinate officials, but the nominations are to be made and offered by such employees. It is urged that the expression 'such employees' entitled to make and offer nominations is to be interpreted as including both employees and subordinate officials. As the three members constituting the labor group are to represent both employees and subordinate officials, it seems not unreasonable to conclude that the expression 'such employees' entitles both

employees and subordinate officials to make and offer nominations. Inasmuch as the organizations named in our original regulations include or may include a small percentage of subordinate officials not so included as well as employees who may not be members of or represented through the organizations originally named by us, are entitled, under appropriate regulations prescribed by us, to make and offer nominations for members of the labor group.

"In coming to this conclusion it is appropriate to reaffirm our conviction that the great mass of the railroad employees and subordinate officials are members of or represented through the organizations named in our official regulations. It is also true that a percentage of the organizations and employees who now contend for their separate right of making and offering nominations for members of the labor group is included in the membership of the organizations named in our original regulations.

"In view of the above considerations we have determined to supplement the regulations originally put forth by adding a fourth group for the purpose of making and offering nominations for original appointment as members of the labor group on the labor board. Included in this group 4 are the following organizations which comprise all organizations from which we have received averments that their separate right to make nominations ought to be accorded under the transportation act, 1920, except the Railway Traveling Auditors' Association of America and the Supervisory Station Agents' Association, the membership of which we have held are not included in the term 'subordinate official.'

Group 4:

Railway Men's International Benevolent Industrial Association.
American Federation of Railroad Workers.
Order of Railroad Station Agents.
American Train Despatchers' Association.
The Roadmasters' & Supervisors' Association of America.
National Order of Railroad Claim Men.
Railroad Yardmasters of America.
International Association of Railroad Supervisors of Mechanics.
International Association of Railroad Storekeepers.
Colored Association of Railway Employees.
Brotherhood of Railroad Station Employees.
Order of Railroad Telegraphers, Despatchers, Agents and Signalmen.
Brotherhood of Railway Clerks.
American Association of Engineers.
Grand United Order of Locomotive Firemen of America.
Porters' Union.
Skilled and Unskilled Laborers (Railway).
Order of Railway Expressmen.

"The accredited representatives of the above organizations, duly authorized to act, shall agree among themselves upon nominees representative of each organization, or of nominees jointly representative of a number of such organizations, provided they agree among themselves upon nominees jointly representative of any of the organizations above named. The nominations agreed upon by each of the above-named organizations, or agreed upon as jointly representative of any of the above organizations, shall be transmitted direct to the President, accompanied by a certificate that the nominations have been made in accordance with these regulations, and should also include statements submitted by the duly authorized representatives of each of the organizations, or of such organizations voluntarily associated for the purpose of making joint nominations, setting forth their present total membership, exclusive of officials not embraced within the class of subordinate officials as defined by the commission's regulations of this date, distinguishing between subordinate officials and higher officials; the percentage of the membership of such organizations, exclusive of such higher officials, who are or may be members of the organizations named in our regulations of March 8, 1920; and the distribution of such membership as between employees and subordinate officials."

The commission has also issued its regulations designating the classes of employees that are to be included within the term subordinate official under Title III of the transportation act, 1920.

Public hearing having been had on March 15, 1920, "for the purpose of determining what classes of officials of carriers shall be included within the term 'subordinate official,' as that term is used in sections 300 to 313, both inclusive, of said transportation act, 1920," the commission prescribes that the term "subordinate official" as used in said portions of said act shall include the following:

Claim agents. This class shall include district claim agents and those lower in rank who are not vested with authority to settle claims, with or without limit, or to bind the company to pay claims, without securing such authority after reporting to a superior officer.

Engineers of mechanics. This class shall include civil engineers inferior in rank to engineers of maintenance of way, chief engineers and division engineers, draughtsmen, engineers of maintenance of way, and other engineers of mechanics who are not vested with authority to employ, discipline or dismiss subordinates.

Foremen. This class shall include foremen of mechanics, shops, tracks, bridges, etc., who are not vested with authority to employ, discipline or dismiss subordinates.

Supervisors of signals. This class shall include those who are employed as supervisors of signals with rank below the grade of assistant supervisor of signals.

Yardmasters. This class shall include yardmasters and assistant yardmasters who are not vested with authority to employ, discipline or dismiss employees. It does not include general yardmasters at large and important switching centers where of necessity such general yardmaster is vested with responsibilities and authority that stamp him as an official.

Train despatchers. This class shall include train despatchers who are not vested with the authority to employ, discipline or dismiss employees.

Storekeepers. This class shall include storekeepers or foremen of stores who are not vested with authority to employ, discipline or dismiss employees or to make purchases. It does not include general storekeepers or assistant general storekeepers.

"The above definitions," the commission says, "include all of the classes of employees whose claims to recognition as subordinate officials were presented at the hearing, except traveling auditors and supervisory station agents. The traveling auditors have a fiduciary relationship to the company. Their duties and responsibilities vary, but all partake of the same specific relationship of trust. The supervisory station agents are those who have supervision of the work of other station employees. They cover the range from the station where one employee other than the agent is employed to the agents at the largest and most important points. They are the official and responsible representatives of the company in its relationships with the public and frequently in a legal sense. Their compensation naturally varies with the responsibilities of their positions. It is not believed that either of these classes can be consistently included within the term subordinate official, as that term is used in Title III of the transportation act, 1920. The list of subordinate officials above prescribed may be enlarged or restricted after due notice and hearing, if and when occasion warrants."

WHAT IS REQUIRED is a market for railroad securities. This can be secured only by making railroad securities a paying and a secure investment.—*Minneapolis Journal.*

C. & E. I. Compensation Fixed

WASHINGTON, D. C.

THE BOARD OF REFEREES appointed by the Interstate Commerce Commission has issued a decision fixing the annual compensation of the Chicago & Eastern Illinois for the use of its property by the government during federal control at $4,450,000 per annum, which is approximately its net operating income for the year 1917, as compared with its average net operating income for the three years ending on June 30, 1917, of $2,946,000. The government had contended that the just compensation due the railroad did not exceed that amount and probably should be less. In their declaration as first filed with the board the railroad company and the receiver asked $6,196,760 as their annual just compensation, but the claim was amended during the proceeding and the final figures claimed were $9,943,178. The applicants also asserted that the minimum amount of their just compensation per annum would be $7,022,356, which was computed as being at the annual rate of 8 per cent on the investment in road and equipment as of December 31, 1917.

According to the report, the railroad maintained that during the control of the Chicago & Eastern Illinois by the Frisco System during the 11 years ending on May 27, 1913, it was undermaintained and that after termination of that control the receivers performed the deferred maintenance and also improved the railroad by extensive betterments so that when the government took it over it was a greatly improved and well equipped railroad and a going concern of large carrying capacity. The applicants, therefore, insisted that just compensation should not be measured by the income of any time prior to the year 1917 but by the net railway operating income for the calendar year 1917, which amounted to $4,048,030.

In addition, they asserted that in order to ascertain the full measure of their just compensation, $2,844,730 should be added to represent increased revenues from accomplished and expected increases in rates, $688,928 to represent car rentals collectible from foreign roads on a surplus of cars owned by the Chicago & Eastern Illinois, $1,765,022 to represent excessive and abnormal charges for equipment maintenance included in the receivers' operating expenses for 1917, which reduced its net operating income to that extent, and $236,468 to represent increases in revenue growing out of the recent decision by the Interstate Commerce Commission in the railway mail pay case. These additional sums brought the total claim up to $9,943,178. The report of the referees discusses each of these claims in detail and reaches the conclusion that no specific sum should be added on their account although they are said to be taken into consideration in fixing the final amount awarded.

Regarding the property investment, it is stated that the figure stated was not supported by detailed evidence on the ground that the present cost of reproduction new would be approximately 75 per cent higher. The government suggested, on the other hand, that if the value of the property should be based upon the market price of the securities on December 31, 1917, it would be only $46,916,744 instead of $81,756,217 as claimed. The report says the evidence does not show what the property could have been sold for or rented for on or about December 28, 1917, nor that the property had a market value, and that the record does not contain satisfactory evidence as to the various criteria of value generally recognized.

The applicants' claim that, despite the war conditions which created the extraordinary emergency for many railways, the Chicago & Eastern Illinois was at the time it was taken over in a peculiarly advantageous position and about to realize extraordinary profits much larger than its standard return, was subjected to a detailed analysis and the referees decided that the value of the use of the railroad subsequent to December 28, 1917, could not be accurately measured solely by its income prior to 1917, which was much smaller than its income during 1917, nor can it be accurately measured by giving greater weight to the earnings during federal control. The report says the tonnage of coal during 1918 was materially larger than the coal tonnage of 1917, but that the 1919 tonnage was substantially less than the 1917 tonnage and "while there is some indication in these figures that abnormal war profits may have accrued to the receiver during 1917 we are not convinced by the government's evidence that the receiver would have earned less than the operating income for the year 1917 had the receiver been permitted to operate the railroads throughout the 26 months of government control."

On the other hand, it is stated that the substantial increases in the costs of operation were a necessary incident of the times and probably would have increased the operating expenses of the receiver more or less had he operated the railroad during the 26 months and it has not been possible from the record to estimate or measure precisely the additional profits from increased rates which would have accrued to the receiver had he operated the railroad during the period of federal control and assumed the increased operating costs and had the benefit of increased rates.

The report says the evidence submitted on behalf of the railroad purported to indicate profits to the receiver to the whole extent of the increases in rates, but that the applicants have not recognized the fact that some profits from the increased rates would probably be absorbed by increased operating expenses. In reply to a suggestion of applicants that increased operating expenses would necessarily compel further rate increases, it is stated that the increases which were allowed by the interstate and state commissions during 1917 were, at least in part, granted for the purpose of meeting increased expenses. The evidence on this point is, therefore, dismissed as largely speculative. Regarding the claim on account of increased car repairs during 1917, the report says that the just compensation awarded recognizes the increased earning capacity resulting from the improvement and maintenance program, but that the evidence was insufficient to show that the applicants are entitled to any sum under this item of the claim.

In its claim on account of car rentals, the company used a rate of $1 per day as a reasonable per diem rate for its cars, but the report says that this rate was in excess of the actual per diem rates of 60 and 75 cents in force throughout 1917, and that the evidence does not show the number of cars needed to handle the local or interline traffic of the railroad during any particular period, nor that such needs remained at a fixed or constant number of cars during any particular period and, therefore, that the evidence does not warrant a finding that the car supply was greater at the time the road was taken under federal control than the car supply on a fully equipped or fairly well equipped coal carrying railroad. The referees held that the applicants have failed to establish that they were entitled to compensation on account of this claim, but stated that the facts shown had been taken into account in determining the just compensation for the use of the property as a whole.

The claim on account of back mail pay was dismissed on the ground of a total failure of proof in support of the amount which, it is said, was calculated by using an increase of 40 per cent to represent the effect of the commission's decision.

TO ATTRACT CAPITAL.—Given assurance of reasonable income to be derived from living rates by economical, efficient management, they would attract capital for improvement of existing lines, for construction of new lines and for purchase of cars and engines.—*Portland Oregonian.*

Bituminous Coal Commission Report Made Public

Majority Recommends New Wage Awards—Suggestions as to Transportation and Storage

WASHINGTON, D. C.

THE WHITE HOUSE on March 23 made public the report of the commission appointed by the President to adjust the wage controversy between the bituminous coal miners and operators, a majority of which awarded an increase of wages of 27 per cent, including the 14 per cent increase already allowed by Fuel Administrator Garfield, making an estimated increase in the wage cost as compared with that of October 31, 1919, of $200,000,000. The report, together with a minority report by Commissioner John P. White was transmitted to the representatives of the miners and of the operators by the President with a letter in which he said that they should make arrangements for convening the necessary joint conferences as soon as possible to put into effect the provisions of the award, as agreed by representatives of both sides. The President had agreed, if the commission reached a unanimous decision, to confer upon it the power to fix the price of coal, but as the decision was not unanimous and as he had concluded that it would not be expedient for the government to continue to exercise price control under its war powers after April 1 an executive order was issued suspending as of April 1 his order of October 30 restoring price control and also all other orders relating to the regulation of coal under which the President's powers have been delegated to Director General Hines. The order of February 25, relating to the regulation of coal exports by the Tidewater Coal Exchange, was, however, kept in force. This order re-establishes the status as it existed before the coal strike, except as to the order relating to the Tidewater Coal Exchange, as the orders of the Fuel Administration which had been suspended were reinstated at that time in order to deal with the strike situation, and the question as to how much the increase will add to the price of coal is therefore left to be determined by the operators and by commercial conditions.

The 14 per cent increase in wages already awarded was estimated to have added $96,000,000 to the wage cost. The additional increase now awarded adds another $104,000,000.

The majority report by Commissioners Henry M. Robinson and Rembrandt Peale contains important recommendations relating to the relations between the railroads and the coal business which have already been taken up with some of the railroad executives with a view to co-operation in putting them into effect.

Tonnage workers will have received, under this award, an average increase in wages since 1913 of 88 per cent, and day men, part of whose previous advance was based on existing inequalities in compensation rather than on increased living costs, will have received an average advance of 111 per cent. The other main point of the United Mine Workers' contention—a reduction in the working hours from eight to six hours a day, and five days a week—was not granted. The commissioners stated that they were convinced that a curtailment of productive energy would react not only against the whole population but against the miners themselves, because while it was declared essential that the miners shall have living wages, it was also declared to be likewise essential in the public interest that there shall be no let down in production. The commissioners expressed the opinion that had they shortened the day by one hour, it would be equivalent to an additional cost of over $100,000,000.

"We have sought and believe that we have found some of the principal reasons for the weakness in this uncertain and troubled industry, and we offer a method for remedying the most important of these conditions," the commissioners said in a letter to the President.

"A wage settlement for the moment is not a correct or adequate answer to the problem. The coal industry has been on an unsound basis for years, because of its seasonal character and the resulting car shortages and car service intermittencies. The heavy movement of bituminous coal comes in the fall and winter. Inevitably, with the buying and movement limited to one season, there is a great car shortage which limits production. When the market drops in the spring and summer there are idle men, idle mines, and idle cars. From the standpoint of employers and employees, the industry has yielded a hazardous return.

"The solution of the problem is to bring about evenness of production and distribution. This can be done by the co-operation of the railroads, public utilities and steel companies as consumers, on the one side; and of the operators, the Interstate Commerce Commission, the banks, and the Federal Reserve System, on the other side."

In addition to the awards the following specific recommendations are made:

(1) That an executive order be issued instructing all federal departments and other federal agencies to pu chase, transport, and store at the point of consumptio.., where such action may be practicable, an estimated three months' winter supply of bituminous coal before July 1 of each year.

(2) That the Council of National Defense assume the duty of obtaining the support of the general public, particularly the large consumers, in the stabilization of the coal industry through the purchase, transportation, and storage at the point of ultimate consumption of its winter supply of coal—this to be done during the spring and summer months.

(3) That an executive memorandum be issued to the Interstate Commerce Commission transmitting to that body a copy of this report with the findings, awards, and recommendations, to the end that the Interstate Commerce Commission may aid in the solution of the problems herein outlined, and in the hope that the Interstate Commerce Commission will give particular attention to the questions of seasonal freight rates, car supply, and car distribution, as well as the problem of railway coal purchase for storage.

(4) That executive authority be issued permitting the transmission to the governors of the various states, to county and municipal authorities, and to the various state railway and public utility commissions copies of this report and of the specific reocmmendations made therein; and that the state railway and public utility commissions make use of their influence with the various public utility corporations looking toward the early purchase and storage of coal by these corporations reflecting, if necessary, the excess cost of such storage in authorized rates, and also to the end that instructions may issue from state, county, and municipal authorities directing the purchase and storage of three months' supply of coal on or before July 1, of each year, by and for the use of the states, counties, and municipalities, particularly on public works and in public buildings.

(5) That the Interstate Commerce Commission consider the possible effect of a graduated seasonal freight rate that is lowest in the spring and a monthly graduated increase in rates until the late fall.

(6) That copies of this report with its findings, awards, and recommendations be transmitted to the carriers to the

end that they may be enabled to co-operate, particularly in regard to car construction and distribution, coal storage, and the elimination of the practice of commandeering.

(7) That a copy of this report be transmitted to the Federal Reserve Board to the end that federal reserve banks be asked to favor as eligible for rediscount paper drawn against coal in storage.

(8) That the Interstate Commerce Commission, state railroad and public utility commissions, within their jurisdictions, issue, where lawful, rules controlling car distribution among mines, to the end that no particular mine or mines may be permitted to obtain through a practice of car assignment and guarantees, preferential car service.

(9) That carriers, and, if necessary, the Interstate Commerce Commission and the various state railway commissions, within their jurisdictions, issue the instructions necessary to abolish the practice whereby purchasing agents of carriers use the company's control over car supply to force down the price of railway fuel.

(10) That the operators in supplying their quota of fuel to the railroads avoid, except in emergencies, the use for that purpose of coal whose properties make it more valuable for other uses.

(11) That all data relating to the mining, distribution, and consumption of bituminous coal be co-ordinated and correlated periodically and regularly by some one federal agency such as the Interdepartmental Board of the Council of National Defense, in order that it may be available for any committee or commission hereafter called upon to investigate controversies between operators and miners in the bituminous coal industry.

In discussing the transportation questions relating to coal the report says in part:

"We believe that steps in the direction of standardizing the demand for coal should be taken by the principal consumers, and are in possession of evidence that many of the largest consumers of coal delay purchase and delivery until the late months of the year and that outside of that part of the central competitive field having Great Lakes shipments, the smallest movement of coal to consuming terminals is in the spring and early summer, at which time some mines are closed down while others operate irregularly.

"The seasonal nature of the demand for coal makes it necessary for the mining companies to maintain a capacity sufficient to meet the maximum demand in a comparatively short period of time. This excessive capacity involves the employment of a large labor reserve and is one of the main causes of the labor unrest prevailing in the industry. Nor does this fluctuation in production affect only the mine and the miners themselves, but spreads to the railroads and through the railroads to the entire productive machinery of the Nation.

"For many years the railroads, and especially the coal-carrying railroads, have to a great extent depended on a practice that has grown up of protecting themselves in the winter months by commandeering coal consigned to other consumers. In some degree the public utilities have counted on this form of a priority. The railroads are consumers of about 30 per cent of the total coal production of the country, and we have presented to certain of the executives of the larger systems a request that the railroads accept the principle that it is their duty to the public to move coal in the months that normally are months of low movements to consumption terminals, such movement to be in excess of their then needs, thereby gradually accumulating a three months' supply before the winter, the railroads to come out at the end of the winter with possibly 20 or 30 days' supply on hand. This movement would be more economical than the movement in the winter, and, from the standpoint of the coal railroads at least, the lower cost of movement would, to a great degree, offset any cost of storage.

"The acceptance of this principle by the railroad executive heads has been general. The Pennsylvania Railroad and the New York Central lines expressed their acceptance in an especially liberal spirit. We wish again to state that this is a duty of the railroads and that some method should be devised under which they will provide such storage.

"In the case of the public utilities we believe that they, too, have a duty to perform to the public and should not rely on any form of priority when the pressure comes in the winter, and to this end they should be called upon to move and store coal in the summer months in excess of their needs, going into the winter months with 60 days' supply in storage. We feel that these two groups owe this as a duty, and that in both cases, if there is an increased cost, it will be recognized by the rate-making authorities.

"The next largest group of coal consumers is the steel industry. We have presented the problem to certain of the heads of important steel concerns, including the United States Steel Corporation, and they express an intention of increasing storage of coal and movement of the same in the months of low movement along the lines of the plan here suggested.

"It is believed that the Federal Reserve Board and the several federal reserve banks will favor considering as eligible for rediscount paper drawn against coal in storage.

"In addition to these groups, we recommend strongly that all government institutions, national, state, municipal, and local, purchase, receive, and store coal during the spring and summer months in anticipation of the winter's requirements.

"We believe that if the various groups mentioned carry out the plan of storing from two or three months' requirements, beginning the winter with this supply on hand, the result will be a decided stabilization of the coal industry, a considerable measure of relief to the carriers, and a general economic saving to the public and the Nation, and, further, that the practice would result in the minimizing of the commandeering and confiscation of coal on the theory of priority. We feel, too, that unless some plan of this kind is adopted, we are bound to have recurring conditions of coal shortage in the winter months as in the past three years, and that no need for such a situation exists. In this connection, the question of the practicability of storing bituminous coal arises. We are fully aware of the difficulties involved, but feel, on the basis of expert opinion, that these difficulties are not insurmountable.

"It must be remembered that in large operations, such as the steel and the coal industries, the cost and facility of transportation is vital in keeping down the cost of the product, while to the ultimate consumer the costs which are added by the retailer and the middlemen are even greater factors.

"The Nation's total freight-car supply was inadequate even before the war, and many mines were shut down for longer or shorter periods, even without regard to seasonal movement, simply as a result of car shortage.

"We believe that it is urgently necessary for the railroad companies to construct an additional number of all types of freight cars, in order that they may be in a position to use the open-top cars exclusively for the purposes for which they were intended.

"The carriers of the country own nearly a million open-top cars and depend upon coal transportation for about 30 per cent of the total railroad traffic. On certain roads fuel transportation amounts to more thn 50 per cent of the freight moved. The idleness of coal cars during the summer months, coupled with the excessive activity during the fall months, forces the railroad themselves to employ a large number of men and to provide for a surplus amount of rolling stock for winter months and an excessive amount of storage yards during the summer period when the cars

are not in use. This in turn is an added burden upon the people of the United States through a general increase in traffic charges, as well as in the increased cost of coal.

"The recommendation is made that the Interstate Commerce Commission make the necessary provision, within its jurisdiction, to enable the railroads to provide a sufficient amount of rolling stock, motive power, and other facilities to meet the demands of industry. We feel that even if this additional construction should be reflected in rates it would be ultimately to the advantage of the consumer, as all industries suffer from intermittency in distribution, and the public bears the cost of this intermittency in the higher price of all commodities, particularly coal.

"This condition can only be rectified by the construction of sufficient freight cars of all types and of a sufficient number of locomotives to handle them.

"Conditions in this respect have become considerably worse during the last three years. Prior to the war freight-car construction of all types averaged about 125,000 cars per year. During the war period and since the armistice, although the need for cars increased, the total freight-car construction of all types has been but 250,000 cars. This means an average annual production during the past three years of only about two-thirds of the previous yearly car output.

"During the war the existing car equipment was more strenuously utilized and repairs were consequently delayed, so that car mortality has been very heavy. This has been aggravated by the fact that cars allocated to foreign lines have received even worse treatment and have suffered still greater deterioration.

The additional expansion of the coal industry during the war, by increasing the number of mines to be served by the railroads, has also aggravated the situation and has rendered the car equipment still more inadequate for the purpose of an effective coal distribution.

"The consequence is a serious shortage of all freight cars, resulting in many instances in the diversion of open-top cars to the movement of commodities of higher classification and rate—commodities which under ordinary conditions would move in box cars. The coal industry suffers from this diversion, as it diminishes still further the number of cars available for the transportation of coal.

"At the same time it is realized that the carriers cannot be expected to provide a sufficient number of coal cars to take care of the peak of the business during the months requiring maximum delivery, and to carry and store the extra equipment during the slack months. It is our belief that a more even distribution of the demand for coal throughout the year will be an important factor in overcoming this difficulty. The following suggestions have been made to the commission as to methods of overcoming car shortage, car irregularity, and seasonal operation:

1. A difference in railway freight rates on coal to be graduated through the summer months in districts other than those moving coal to the Great Lakes. This question, however, is properly within the province of the Interstate Commerce Commission to decide, and the commission has recommended that this subject be given due and careful consideration.

2. A difference between summer and winter prices of coal, such difference to be fixed by the operators, but, in view of the fact that there are in the neighborhood of 7,000 operators in the bituminous coal industry, the commission believes, without passing upon the legality of an agreement to reduce prices for the summer months, that this plan would be impracticable.

"Railroads have depended for a great many years and to a large extent on their accepted right to divert coal to their own use in case of shortage. This practice, by protecting the railroads against actual disaster, has resulted in a great injury to the coal industry and to the individual consumer of coal.

"In its investigation the commission requested of and received from the United States Railroad Administration a statement covering, in outline, the former and present rules with respect to the assignment of cars to mines. In transmitting this statement the Railroad Administration points out the prewar rules covering car assignments, which tended to irregularity in our distribution, while not universally relied upon by carriers, were quite generally prevalent in the East, and were based upon a line of decisions of the Interstate Commerce Commission, of which the leading case is that of Traer *v.* Chicago & Alton Railroad Co. et al.; decision confirmed in the Supreme Court of the United States. The statement follows:

> The common understanding of the prewar rule was this: If a carrier on contract purchased the entire output of a mine, it was entitled preferentially to assign cars to that mine for loading that coal day by day.
>
> If the carrier purchased only a part of the output of a mine, it was entitled preferentially to place cars for the protection of that loading at such a mine. In the working of this portion of the rule, if the number of cars of railroad fuel contracted for was in excess of the number of cars furnished that mine that day on the regular commercial distribution of coal cars, the mine was entitled to an arbitrary and preferential assignment of enough additional cars to enable it to load all the railroad fuel obligated to be shipped under the contract.
>
> If, on the other hand, the number of empty cars accruing to the mine on the regular commercial distribution was in excess of the number required to be shipped with the railroad fuel coal, then the mine was entitled to use the excess of empties above those necessary to load the railroad contract for the loading and shipment of commercial coal.

"During the investigations we found that the evils growing out of the preferential assignment of coal cars were fully recognized during the war and, as a result of a conference between the President, the Director General of Railroads, and the Fuel Administrator, the preferential assignment of cars was abolished. On May 24, 1918, the Fuel Administrator issued an order reducing the price of coal 10 cents per ton. The railroads, by the employment of assigned cars, had been frequently able to negotiate their fuel purchases at more favorable prices than the commercial trade, and because of relinquishing their right to assigned cars, the carriers faced the problem of having their fuel cost increased. As a concession to the railroads and in recognition of the loss that the deprivation of assigned cars entailed, Dr. Garfield issued his order of May 24, 1918. The principle of even car distribution was not effective, however, until approximately July 1, 1918. The delay was occasioned by the necessity for providing the necessary machinery by which the railroads' fuel needs could be complemented when the car supply was insufficient to give them their full orders, and this was done by the Fuel Administrator's requisitioning coal in quantities needed by the railroads.

"The statement of the Railroad Administration to this commission also states that:

> When the first uniform mine rating and car distribution rules were published September 10, 1918, the new rule abolishing the preferential assignment of cars for railroad fuel loading was carried in the uniform mine rating and car distribution rules by a provision that no such assignment for railroad fuel loading could be had except upon authority of the car-service section. This authority has never been granted since. The reason for this provision in the rule was to take care of emergencies if no other way of caring for the emergency could be found, whether to protect railroad fuel loading or other essential loading, the point kept in mind being particularly United States Navy coal.
>
> It should be borne in mind that private cars—that is, cars other than railroad owned, have been handled upon a somewhat similar rule as that which, under the prewar practice governed the placing of assigned cars for railroad fuel loading. That is to say: The private cars were arbitrarily placed for the owner's loading. If on any day the number of private cars so placed did not equal the number of empty cars to which the mine was entitled under the commercial distribution, the mine was entitled to additional railroad cars, to make up the deficiency.

"It is understood that Paragraph 402 of the Cummins-Esch bill, approved February 28, 1920, places control of coal car distribution and assignment within the jurisdiction of the Interstate Commerce Commission. On March 4, 1920, the Interstate Commerce Commission issued a recommendation to the carriers that they continue in effect the uniform rules of

car supply established by the Railroad Administration. The issuance of such a recommendation by the Interstate Commerce Commission raises an inferential question as to whether the maintenance of even car distribution is obligatory through the provisions in the Cummins-Esch bill, since the comment of the Interstate Commerce Commission is a recommendation only. Whether the Interstate Commerce Commission can make such a recommendation a mandate is a matter not within the province of the Bituminous Coal Commission to decide.

"It is, however, recommended to the Interstate Commerce Commission and to state railway commissions within their several jurisdictions that, wherever lawful, rules and regulations be issued governing and controlling car distribution between mines, to the end that no particular mine or mines may be permitted to obtain preferential car service through the use, by railway purchasing agents, of their power to obtain railway fuel at reduced prices through the guaranteeing of car supply to favored mines or to operators with whom the railway may have fuel contracts.

"We make this recommendation because we find that the practice and abuse of car guarantees has militated against the interests of the general public by contributing to the irregularity of operation of mines not having such preferential contracts. At the same time, this practice has resulted in an unfair competitive advantage to those mines that secured such contracts.

"The commission also believes that railroad coal should be furnished by the various mines in proportion to their productive capacity with due regard to the quality of the coal. In furnishing to the railroads by the various mines, their quota of coal, it is recommended that the railroads be not required to place at each mine each day a sufficient number of cars for its proportionate amount of railway fuel, but that a plan be worked out permitting the railroads to place at each mine a number of cars sufficient to keep the mine in operation all day. This practice would reduce the cost of assembling railway fuel. In supplying to the railroads their quota of fuel the mines should avoid, except in emergencies, the use for that purpose of coal the properties of which make it more valuable for other uses."

Development of the Territory by Alaskan Railroad

A. T. VOGELSANG, acting secretary of the interior, has submitted the following in response to a Senate resolution requesting information as to the development of traffic and the settlement of the country traversed by the government railroad in Alaska:

"Under the direction of this department over 1,000,000 acres of agricultural lands in the territory of Alaska have been surveyed to the end that they may be available to entry and patent under the public land laws, particularly the homestead laws as applicable to Alaska. A considerable part of this surveyed territory is within country traversed by or tributary to the government railroad now being constructed in Alaska. Under the coal-land leasing law enacted October 20, 1914, coal lands in the Bering river, Cook inlet, Matanuska and Nenana coal fields have been divided into leasing blocks or units and offered for lease. The two fields last named are tributary to the government railroad in Alaska. Under the authority contained in the Alaska railroad act of March 12, 1914, town sites have been established upon public lands along the line of the government railroad and lots for business and residential uses disposed of through the land and industrial department of the Alaskan Engineering Commission under the supervision of this department. Such advice and assistance in finding markets has been given to farmers located in the territory tributary to the railroad as could be given without the expenditure of money therefor.

"Other than as stated in the last paragraph no direct steps have been or are being taken to develop traffic for the railroad.

"No organization has been created charged with the duty of settling the country and developing traffic for the railroad for the reason that this department does not deem itself authorized to expend money appropriated by Congress under the act of March 12, 1914, and acts supplementary thereto, for purposes other than those described in the law, the principal purpose of which is the construction and operation of the railroad and of telegraph and telephone lines. Careful consideration of the law fails to disclose authority to expend money appropriated thereunder for such purposes as publication of literature for the advice and information of settlers or for spending money for aiding settlers to locate themselves on the land or acquire stock and equipment or for the construction of roads or trails connecting tributary districts and settlements with the railroad.

"I am firmly convinced that some such work as is implied in resolution 329 should be authorized in order that Alaska may be developed and that the government railroad may be supplied with traffic. Unless some such steps are taken, it may well happen that the railroad will be a losing proposition and that the territory will remain in a comparatively undeveloped condition. In this connection I inclose a copy of letter addressed by former Secretary Lane to Hon. Wesley L. Jones, United States Senate, February 28, 1920."

Mr. Lane's letter says in part:

"Mr. J. L. McPherson of the Alaskan Engineering Commission has recently submitted to me a report covering the development of traffic for the government Alaskan railroad, in which he strikingly sets forth the need of necessary aid and encouragement in the creation of local industries and a growing population that will furnish traffic for the railroad. His report contains the following summarized recommendations:

Natural resources opened to development.

National affairs in Alaska administered by a board with office in Alaska.

Sale of live stock to settlers.

The federal farm loan act extended to Alaska and modified to meet Alaskan conditions. To provide for loans to settlers for the purchasing of farm equipment and for improvements, and for loans to associations of farmers for the erection of creameries, dehydrating plants, storage, and other facilities.

Construction of roads and trails connecting tributary mining districts and settlements with the railroad.

Reindeer industry open to development by white population in regions tributary to the railroad.

Publications of illustrated literature briefly describing the country traversed by the railroad, its topography and climatic conditions, resources, and opportunities for settlement.

"The government railroad in Alaska will be a success only to the extent in which local industries are created in the region tributary to the railroad and the country peopled. If this railroad were privately owned, all possible aid and encouragement would be extended to such ends in the building up of traffic. Constructed and owned by the government in order to rationally develop Alaska, there is infinitely greater reason for such constructive work.

"The Alaskan Engineering Commission should be now empowered to do those things that will aid in the creation of local industries and the peopling of the country tributary to the railroad. Such measures of aid should also be extended where necessary to other sections of the territory. Only by such means can Alaska progress and traffic be created for the railroad.

"On the eve of my retirement I wish to express the hope that Congress will at an early date enact legislation providing for the measures above recommended that will permit Alaska, through the rational utilization of its rich natural resources, to become far richer in an increasing and prosperous citizenry."

Seasonal Differential Rates in Coal Proposed

Senate Committee Suggests 15 Per Cent Reduction in Summer to Promote Early Production

THREE BILLS affecting the relations between the railroads and the coal industry were introduced in the Senate on March 17 by Senator Frelinghuysen as chairman of a sub-committee of the Senate Committee on Interstate Commerce that has for some time been investigating the coal situation.

The first bill provides that during the period from April 1 to August 31 in each year railroads shall not charge for the transportation of coal and coke a rate higher than 85 per cent of the regular published rate in effect when the act takes effect and that the rates shall be increased to 115 per cent during the remainder of the year from August 31 to March 31, the purpose being to promote the production and shipment of coal during the spring and summer months. The Interstate Commerce Commission is authorized to change the rates, to remove discriminations and also to change the percentage of differential whenever it is of the opinion that the percentage named will cause shipments to be made in such disproportionate quantities at any period of the year as to prevent the carriers affected from handling their traffic properly, from using their equipment and facilities efficiently, or from receiving just and reasonable revenue from the coal traffic as a whole.

The second bill is designed to terminate federal control of the coal and coke industry by repealing the provisions of the Lever act, under which federal control is now exercised, and also contains a section to make it unlawful for a railroad to confiscate, seize or divert for its own use or for any other purpose, whether with intent to make proper compensation therefor or not, any coal or coke of which it is in possession solely by a common carrier.

The third bill provides for the appointment of a federal coal commissioner to investigate the organization, management and practices of coal dealers and operators, costs and profits in connection with the mining, sale and distribution of coal, prices for coal, the distribution, storage and sale of coal and the methods and practices employed therein, the consumption of coal and the transportation of coal in commerce, including the distribution of coal cars. It is proposed that the commissioner shall be appointed by the President, that he shall investigate also questions pertaining to wages and working conditions of miners and also methods and prices for the storage of coal. He would also be directed to co-operate with the Interstate Commerce Commission in promoting the proper distribution and most efficient use of coal cars in commerce and to co-operate with dealers, consumers and others to encourage the construction of facilities for the storage of coal. He would be directed to investigate the desirability and practicability of prescribing statutory standards for various kinds and grades of coal and the desirability and practicability of a statutory zoning system defining the distance from the mine within which coal may be transported in commerce, and to submit a report thereon to Congress before April 1, 1921, with his recommendations. He would be required each year to submit a report to Congress setting forth the activities of his office during the year, together with recommendations for further legislation relating to the mining, distribution, transportation or sale of coal. A provision in the bill makes it the duty of the Interstate Commerce Commission and the Federal Trade Commission to co-operate with the coal commissioner.

In connection with the introduction of these bills, Senator Frelinghuysen made a speech giving voice to various complaints regarding the exercise of the powers over coal distribution conferred upon Director General Hines by the President and the former fuel administrator, and the Senator declared that the several agencies controlling the coal industry at the present time are to some extent interfering with it. He said he and other Senators are inundated with complaints against the policy of the director general in diverting coal and that an abnormal situation is created by government agencies fixing prices, seizing coal and throwing the flow of this important commodity out of its normal channels. The sub-committee, he said, has come to the conclusion that the primary difficulty at the present time is the government interference in price-fixing and in distribution, and that the practical thing to do at present is to repeal the war powers. In order to wind up the various matters arising out of federal control of coal and coke, he said, his bill had provided for a period of 30 days, and it might be necessary to continue the present system longer than that period.

At another place in his speech he said that one of Mr. Hines' assistants had expressed the opinion that by the first of May the present conditions under which the director general has found it necessary to make diversions of coal to meet conditions of shortage would be relieved. He said the methods employed by Mr. Hines, in his opinion, had been "ruthless and illegal to the extent of usurping powers which he does not possess, but which have been necessary to compose the situation."

The Senator also devoted some attention to what he described as the abuse of confiscation by railroad companies of supplies of coal invoiced to private consumers, and for this reason a section of one of his bills proposed to make it a misdemeanor for a railroad company to confiscate coal.

Regarding the proposal to establish seasonal differentials in coal rates, the Senator referred to the complaint of the miners' union that during the summer months many of its members were idle and to their demand for shorter working hours in order to spread the production of coal more evenly over the year. He thought the summer differential also would tend to relieve the condition of car shortage and congestion. In reply to statements by some of the Senators that large numbers of coal cars sent to the West and Northwest during the coal strike have not yet been returned and in some cases are standing on the side tracks still loaded with coal which it is difficult to market since the production of Western coal has been resumed, Senator Frelinghuysen said that now the railroads are back in the hands of their private owners an effort is being made by all the railroads to get the cars back to the owning lines, and that undoubtedly that situation will automatically adjust itself. Senator Frelinghuysen also read a statement by Chairman Clark of the Interstate Commerce Commission pointing out advantages that would result from the system of seasonal differentials in coal rates, as follows:

Chairman Clark's Statement

"1. It would stabilize the price of coal. The capacity output of all the coal mines in the United States, assuming fairly constant operation, would far exceed the present consumption. The output of all these mines working, as at present, only intermittently during the spring and summer months, and working to capacity during the fall and winter months, is barely sufficient to supply the current needs and the greatly increased cold-weather demand for coal. During the winter the demand so nearly equals the currently available supply that scarcity

prices prevail. In addition to this, the actual cost of production per ton is unduly enhanced because the operator must, during the time his mine is closed down or working intermittently, keep together his organization and expend money for the upkeep and maintenance of the property, all of which must be added to the price of coal which he mines and sells during the rush season. If the demand for coal were reasonably constant throughout the year, many of these costs based on holding plant, capital and personnel idle for a large portion of the time would disappear, and the price of coal would more nearly represent only current costs of production plus a reasonable profit, leaving no opportunity for charging scarcity prices during the months when the greatest amount of coal is consumed.

"2. Such legislation would obviate very largely the pressing necessity for more coal cars. The present supply of coal cars, while totally insufficient to handle the fall and winter rush under existing conditions, would be fairly adequate to carry all the coal desired by consumers if this equipment could be kept moving with greater regularity throughout the year, as would be the case if the advantage of lower summer and spring freight rates could be held out to induce consumers to receive coal shipments in advance of their winter needs. Under the present system thousands of coal cars lie idle during the spring and summer, while the whole available supply of coal cars is entirely insufficient to handle the fall and winter emergency.

"3. Such legislation would remedy the present inadequacy of terminal facilities. The large amount of coal which must now be transported within a comparatively short time in each year tends to glut already overcrowded terminals. The increasing inability of existing terminal facilities to handle extraordinary seasonal demands without entailing serious delays and disproportionate terminal costs is one of the most glaring weaknesses in the present American railroad transportation system.

"4. Such a measure would promote regularity of employment in the mines, and would thus settle most of the outstanding grievances of the other miners. Increased compensation for miners, under the present régime. is demanded not so much as an actual wage for work performed but rather as a pension for periods of enforced idleness due to the seasonal demand for coal.

"An examination of some of the disadvantages which might appear to inhere in the requirement of lower spring and summer freight rates for coal shipments reveals that most of these objections are untenable:

"1. No confusion, either for carriers or shippers, would result from changing the rate on coal twice every year. The proposed legislation prescribes that the carriers shall file their tariff rates on coal in the same manner as at present, and, instead of requiring them to alter these tariffs semi-annually, provides an automatic statutory differential below the tariff rate for one portion of the year, and above the tariff rate for the remainder of the year, with discretion in the Interstate Commerce Commission to change the amount of the differential where it finds necessary.

"2. The revenues of the carriers would not be affected. A large amount of coal would still have to be mined and shipped in fall and winter to consumers who lacked the capital, credit, foresight or storage accommodations to enable them to secure their supply during the warmer months. If the 30 per cent differential in favor of the months between April and August, inclusive, should prove an unnecessarily large inducement, so that too great a proportion of coal were shipped during this period, the Interstate Commerce Commission is authorized to change the percentage so as to balance the summer and winter shipments properly.

"3. The transportation of coal in the spring and summer would not embarrass the railroads in handling other seasonal movements—for example, crops. In some localities cars carrying grain are loaded only in one direction, returning empty to the point of origin because of lack of shipments moving in that direction. If coal could be encouraged to move at the same time, this wasteful practice of hauling empty cars might be at least partially eliminated. Operating conditions during the clear weather of the spring and summer months are much more favorable, so that railroads can better withstand heavy demands for transportation at that period of the year than during the fall and winter months, when coal has heretofore moved in greatest volume. The cost to the railroads of transporting coal is also much less in warm weather, when locomotives can haul heavier trains, when they consume less fuel and when fewer employees can handle more traffic.

"4. The acquisition of more coal cars does not afford a practicable and complete remedy for existing difficulties. Under the transportation act recently approved the Interstate Commerce Commission is given the power to require carriers to provide themselves with sufficient cars. But most of the railroads have neither the money nor the credit with which to buy a supply of coal cars adequate for current needs under the present system of large seasonal shipments, so it would be useless for the commission to order them to purchase this equipment. On the other hand, most of the railroads which have enough money or credit to finance such purchases already possess an adequate number of coal cars to care for the needs of their own patrons, and they could not reasonably be required by the commission to purchase additional cars to take care of the traffic of other lines.

"The transportation act also appropriates $300,000,000 as a revolving fund from which loans may be made to the railroads. In view of the fact, however, that this money will very likely be used only in small part for new equipment, and that of the portion which is spent for equipment much will go for new locomotives, refrigerator cars and other types of urgently needed rolling stock, it is not probable that any considerable number of coal cars will be purchased out of this fund. It has been estimated that 100,000 new coal cars will be necessary to handle properly the usual seasonal demand. These alone would cost the entire amount of the appropriation mentioned above. The same statute also provides for creating a general railroad contingent fund, made up of a portion of the excess earnings of prosperous railroads, out of which loans may be made to the railroads, and out of which the commission may purchase equipment and facilities to be leased to the railroads. This fund will, however, be wholly an expectancy for many months to come, and at least one more winter, with its heavy demand on the present totally inadequate coal-car supply, would elapse before any relief could be had from this quarter. Even if funds were immediately available with which to purchase coal cars, and only coal cars were to be built, the car shops in the United States could not turn out sufficient cars between now and next fall to handle properly the coal shipments during the winter of 1920-21, assuming that the proposed legislation is not enacted in the meantime. Finally, even if this money were obtainable and cars would be turned out in sufficient quantity, the acquisition of cars which, under the present system of uniform freight rates on coal, would stand idle the greater part of the year would entail enormous depreciation and capital charges, all of which would have to be borne by the coal transported during the rush season.

"5. It may be urged that the interstate commerce act now contains ample provisions to permit the commission or the carriers to institute lower summer freight rates for coal. The conclusive answer to this contention is that during the many years that the same provisions have been law this practice has never been introduced. When the carriers have been asked to initiate such seasonal rates on coal, the request has usually been coupled with a demand that while rates might be lowered

in summer they should not be raised in winter; and the carriers, facing a consequent depletion of their revenues, have declined to co-operate on this basis. The shippers and consumers, motivated by their individual needs, have been by no means unanimous as to the amount of the difference in rates or the seasons in which lower lower or higher rates should prevail. In the very nature of the case, it is a subject for legislation, where Congress, representing all the people, may enact rules which will take into consideration the interests of all the people.

"The Interstate Commerce Commission, while it might feel justified in approving schedules initiated by the carriers instituting such seasonal rates, could not make such percentages of difference in rates permanent. The carriers, pressed by coal operators or consumers, might at any time file new schedules abandoning or modifying these seasonal rates. General confusion would result."

"It is understood," the Senator continued, "that the commission does not believe that it possesses the power to require the establishment of such seasonal rates on coal. It has never attempted to exercise this power, and it is known that it does not contemplate doing so in the future in the absence of further legislation. The commission assumes that in prescribing rates and practices it is not empowered to initiate new systems of rate making designed principally to remedy general economic situations. It feels that this should be the subject of specific legislative determination and authorization, rather than of mere administrative action.

"Even if the carriers, the shippers and the commission could and did institute such seasonal rate schedules, their action in this matter would be the subject of interminable litigation. It would be contended that no power had been delegated to the commission to approve or initiate such seasonal rates, and the action of the commission in this connection would most likely be enjoined until the matter had been decided by the United States Supreme Court. The result would be that two or three winters might elapse before this urgently needed practice could be put into effect. Definite legislation, such as that proposed, will remedy the situation at once. In view of the fact that the courts have upheld similar differences in rates, based on no less cogent economic reasons—e. g., under the so-called long and short haul clause—there should be no doubt as to the constitutionality of the measure proposed.

"Briefly stating the effect of this measure, it means that from the 1st of April to the 1st of September consumers of bituminous and anthracite coal, used by the industries of the country to the extent of 500,000,000 tons, heretofore purchased practically during the winter months, will have the opportunity of having 15 per cent reduction in their freight rates and a penalty of 15 per cent advance from the 1st of September for the following six months. It means that it will induce the purchase of coal in the summer and, according to Commissioner Clark, will release 250,000 coal cars, which are idle during that period, at a time when the railroads are not congested, and at a time when the coal may be moved more efficiently and effectively.

"I believe that this will solve the great problem in regard to the coal miner's in complaint that he is compelled during the summer months to remain idle a long period.

"Therefore, feeling that this measure will be beneficial to the coal industry, we have decided to present it to the Senate, and ask that the Committee on Interstate Commerce consider it carefully, hopeful that it will be enacted into law.

"A statement has been made by some one who has studied this question that it will save $1,000,000,000 a year to the country in the wastage that now exists."

A FREIGHT RATE that is too low for the railroad is too low for the shipper.—*Chicago Tribune.*

Why Do Not College Men Go Into Railroading?*

By C. B. Breed

Professor of Railroad Engineering, Massachusetts Institute of Technology

WHY DO NOT COLLEGE MEN go into railroading? A few of them do, but many who are well trained for such activities shy from this interesting life. Railroading should offer one of the most fascinating careers to be found. It should teem with interesting problems of the kind which will feed and satisfy the trained mind. The plain fact, however, is that it does not attract the young progressive college man.

Youth is as interested today as ever in the kinds of problems which are met and overcome daily on every well managed railroad. He is merely the grown up boy who would look forward to running a real transportation system with the same zest that he evinced only a few years ago with his toy railroad. The average college man has plenty of enthusiasm and ambition. He needs to be given an opportunity to continue the development of his judgment, his initiative and resourcefulness when he goes out into life.

During the four years of technical school he has been solving one new problem after another in quick succession. His mind has been crowded with new and interesting information at a rapid pace. He has been taught to lay aside the underlying principles of these various subjects in such a manner as to make them available for later use, but he has used them only to a limited extent because neither the school room nor the laboratory can imitate, except in a very limited degree, the real problems which he will meet in the life for which he is preparing. He therefore leaves college with a hunger to tackle life's problems and he expects to work and work hard. He expects these problems to be presented in as rapid succession as he has been accustomed to in the past four years, and if he does not meet them at the start and in numbers and degree such as will tax his mental strength, there is a slowing down of his mental process and a consequent lack of interest. It may be said, and with some force, that he should expect to serve his apprenticeship of drudgery as have many of the present leaders of industry; but to obtain from this product, the college graduate, the results which may properly be expected of him, this product must at the start be understood by his employer. Herein lies one of the faults often laid at the door of the college trained man, namely, that he cannot happily adapt himself to simple drudgery work. The plain fact is that his training has been quite the contrary. He has been running in high gear for four years and to throw his mind into low speed suddenly is too great a strain for most active minds. His work, then, should attract his interest from the start, it should tax his abilities, and if these conditions exist his character will overcome any prejudice he may have against the drudgery part of his service. He cannot be expected to be content if his physical self is employed while his mind remains idle.

This condition is recognized and well fulfilled by most progressive industries. As a rule, they appreciate that the technically trained man has already spent four years or more of intense training preparing himself for his industrial life. He is therefore assigned for a limited time the duty of studying the industry he has elected to follow. He is placed in the plant to study the process step by step and later the organization. It is not expected that he shall work productively in any one of the departments as he passes through them, but he is expected to observe and digest a great deal of information and to acquire the atmosphere of the business. In this probationary part of his service his interest is

*Other discussions of this subject appeared with *Railway Age* of March 5, page 713, and of March 2, pages 757 and 758.

kept alert. The incentive in the form of an assurance of rapid advancement is always before him, provided only that he makes good, that his employer is convinced that he is adapted to the activities of that particular industry. One other important attractive feature is not lost sight of. He is not paid for what he does; he is paid a living salary in anticipation of what he probably will do in the near future for the industry with which he is allied.

These opportunities are offered on all sides by the rubber, the shoe and other progressive industries, and many men at the close of a college training in engineering are entering these industries and are rapidly filling positions of great responsibility. The demand for these young men is so great and so attractive that any such industry as that devoted to transportation must meet this competition if it is to attract college men to it. This the railroads have not done. Only in rare instances do railroads offer interesting work at reasonable salaries to the man just out of college, and as rarely do they give him any definite assurance of a position of responsibility to which is attached a salary in any way commensurate with the ability it demands.

In the first place, railroad officers for the most part lose sight of the fact that the college man has spent four years of hard mental application and considerable money before he applies for his position. He is too frequently classed with the high school graduate in so far as the particular service that is offered to him is concerned. It is not so in other industries. If he is a graduate of civil engineering, he is usually offered the position of transitman in a surveying party, at a low salary, and kept in such position until some one above him dies or has courage enough to quit his job and accept a better one. His progress is so slow, his work so uninteresting because of its monotonous repetition that he usually quits the road in a year or two and finds employment where his training and abilities are recognized and his salary has some relation thereto.

Railroad officers must first understand this product, the technical graduate. It must be realized that if he is a graduate in civil, mechanical or electrical engineering it does not mean that he will never be adapted to the operating or financial end of railroading. His certificate of graduation merely means that he has undergone a systematic mental training in technical subjects, and in more general subjects than is usually appreciated, and has attained proficiency of mental action sufficient to satisfy the faculty of his college that he is entitled to his degree. It usually means that he is a pretty good analytical thinker who will acquire the information that practical experience brings at a very rapid rate and therefore needs only a short apprenticeship before he can be entrusted with responsibilities. The trained mind, not the name attached to the particular course of studies he pursued in developing his trained mind, is the fact to keep clearly before one. It is because of the condition of this trained mind that many graduates of mechanical engineering, for example, have made successful business men in innumerable industrial establishments. It is as absurd to assume that a graduate in civil engineering is not a proper candidate to develop into the presidency of a railroad as to say that a man who has spent four hard years of physical training in a gymnasium is unfit for any other kind of employment calling for physical strength. Engineering graduates are eminently fitted to become candidates for the operating or the traffic departments of railroads, and they should find attractive berths in these departments.

Colleges all over the country are turning out these trained men yearly. Industries everywhere are employing them and rapidly advancing them to attractive positions. The railroads are letting this opportunity pass by.

At the Massachusetts Institute of Technology alone at least a third of the three hundred odd graduates who go forth next June will be well trained to start on the job of manufacturing transportation at a profit. There will be at least ten in the graduating class who have made a specialty of railroading while at the Institute. Their studies have included as well as the usual subjects of civil engineering, railroad construction, maintenance of way, signalling, railway economics, accounting, contracting and operation. Probably not more than two or three of these ten men will go into railroading, even though they have made a special study of it. The majority will be found five years from now holding good industrial positions.

They have elected to specialize in railroading because they realize that the study of this great problem is excellent mental training, is broadening in its influence, and consequently well fits their minds to attack the diversified problems which will be presented in a wide field of industries.

It is doubtless true that the services of technical men are more seriously needed by industries which are competing in the manufacture of an article such as rubber goods. The product of the trained technical mind may have a great influence upon the success or failure of a particular corporation of this kind. It is not so clearly evident that his influence can be so great in the case of a railroad, for railroads are not so keenly competitive and they are hedged about physically and financially by more fixed conditions. But roads with steep grades and poor alignment certainly need the best technical ability to devise economies in operation to meet competition. Branch portions of some roads probably should be abandoned today and turned into highways and operated by automobiles and auto trucks.

Technical knowledge and analytical study of the losing portions of many of the railroads of this country may well be made, with the probable result of distinct modification or revolution in methods of operating them. The inertia of existing conditions has been a very prevalent disease among the railroads of this country. It has been the cause of failure of other industries. The fact that new competing railroads are not looked upon with favor by public utility commissions or by investors has given many railroads a monopoly of the transportation of their particular district. This condition does not tend to develop incentive for progressive methods. Such roads therefore do not attract progressive thinking men as do industries which are keenly competitive.

The attitude of railroads here outlined does not apply merely to the past 5 years. It has prevailed for the last 30 years, ever since technical college graduates have been a reality. Before the college graduate will be attracted in large numbers into this life he must be paid a good salary at the start, be given interesting work of diversified character and assured of rapid promotion if he is entitled to it, with the probability of occupying a position of heavy responsibilities and commensurate salary by the time he is 35 or 40 years of age.

If the railroads cannot do this, the technically trained man, who would do much toward developing and sustaining the seriously needed economies of railroad operation, will not give his life to transportation for the simple reason that other as interesting industrial life daily offers to him all of these attractions.

In closing I would add a word for the railroad officer who has been healthy enough to weather the abuse that has been heaped upon the railroads for the past ten years. It is little wonder that in some instances he is a discouraged man. His hopelessness is contagious, and it has its influence in keeping the young man away from railroading.

Let us hope that the public and its legislators have learned the vital lesson that encouragement of every sort is required to bring our transportation systems out of their present state. If this can become a reality, it is not improbable that the manufacture of transportation may be accomplished so intensively and interestingly as to attract the best young blood of the country.

St. Paul Passenger Train on the Western Electrified Section

The St. Paul Electric Passenger Locomotives*

Details of Design Are Described by Representatives of the Manufacturing Companies

THE TWO NEW TYPES of electric passenger locomotives built for the Chicago, Milwaukee & St. Paul were designed for the same class of service by different groups of engineers working independently; from an inspection of the finished locomotives it would appear that the two types could hardly be more different.

Roughly the requirements for both designs were as follows: The locomotives must collect 3,000 volt direct current power from an overhead catenary. They must be able to haul a 12-car passenger train weighing 950 tons over a two per cent grade, compensated for a distance of 20 miles, and over a 2.2 per cent grade compensated for a distance of 17.8 miles. They must maintain speeds of approximately 25 miles an hour up two per cent grades, 35 miles an hour up one per cent grades, 60 miles an hour on level tangent track and must hold trains on down grades by regenerative braking at speeds consistent with safe operation. The sharpest curve on the main line is 10 deg., but the locomotives must negotiate a 16-deg. curve in the yards satisfactorily. The locomotives must also supply current for lighting the trains and charging the train storage batteries at a voltage of from 60 to 85 and must be equipped with an oil-fired boiler, to be supplied by the railway company, to furnish steam for heating the train.

General descriptions of the two locomotives were published in the *Railway Age* of October 24, 1919 (page 819), and January 16, 1920 (page 233).

The General Electric Locomotive

By A. F. Batchelder and S. T. Dodd.

The running gear of the General Electric locomotive is composed of four individual trucks, two end trucks having three axles each, and two center trucks having four axles each. These trucks are connected together by special articulation joints. The motor armatures are mounted on the axles and the motor fields are carried on the truck frames.

The superstructure is made in two sections of similar design with a third section between them. The third or central section contains the train heating equipment, which consists of an oil fired steam generator, together with water and oil tanks. This unit is complete in itself, and is carried over supports attached to the two middle trucks. It can be readily removed for repairs without interfering with any other part of the locomotive. It is placed between the two operating cabs in order to be easy of access to the engineer's helper or fireman, from either location.

The two end sections are similar to each other in appearance. The operator's cab in either section is on the inner end next to the heater cab above described, in order that the operator can be convenient to the heater and in order to allow a maximum space for apparatus in the apparatus cab or outer end section. Another advantage of this arrangement of cabs is that the operator can have access to any section of the locomotive requiring his presence without passing through a section containing high-tension apparatus. The engineer's or operating cab contains a main or master controller, the air brake valves and handles, and an instrument panel, containing air gages, ammeters, and speed indicator. The engineer uses either of the two operating cabs according to the direction in which he is running.

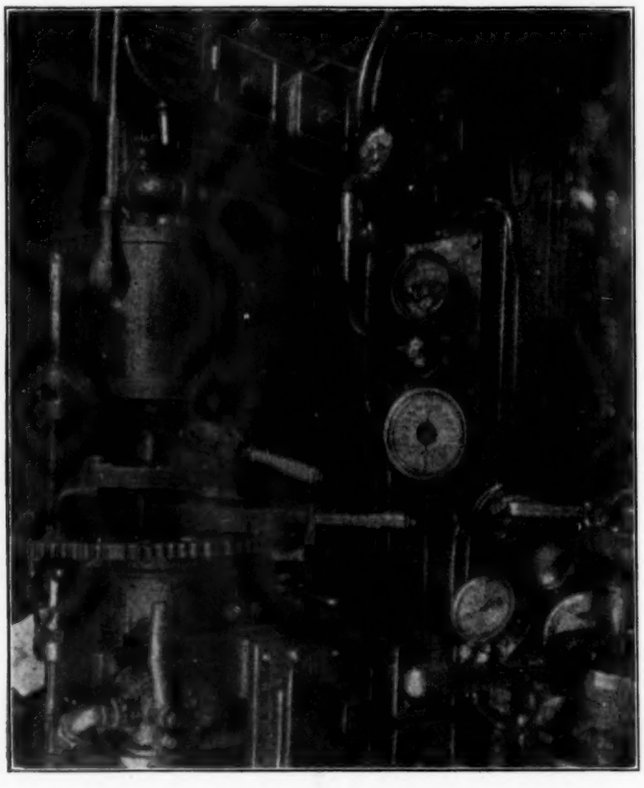
A door gives access from the operating cab to the apparatus section which extends with a cylindrical top to the extreme end of the locomotive. The cylindrical construction naturally adapts itself to the protection of the apparatus included and in addition to this it has the advantage of allowing a clear vision for the operator from his normal operating position. Contained in this apparatus section are the resistors and contactors to control the power circuits of the

*Abstracts of papers presented before the 358th meeting of the American Institute of Electrical Engineers at Pittsburgh, Pa., March 12, 1920.

locomotive. The starting resistors are placed in two rows on each side of the central passage just above the floor of the superstructure and are covered at the sides by removable covers which when opened will allow the separate resistor boxes to be slid out upon the longitudinal running board outside of the apparatus cab. The air compressor for the air brakes, the motor-generator set for train lighting, and the storage battery for marker lights and emergency control, stand upon the same level as the resistors, and can be removed or replaced in a similar manner. Above the resistors are located the contactors with their arc chutes facing a central aisle two feet wide. This allows ample arching space and room for inspection of contactors. Above the contactors is the cylindrical roof of the locomotive with trap doors for removing the contactors in case replacement is necessary.

Motors

The motors are of the bi-polar gearless design which were adopted by the New York Central 14 years ago for operating heavy passenger trains between Grand Central Station and Harmon, N. Y. To insure light weight per axle, flexibility in control, good truck arrangement for curving as well as for high-speed running, twelve motors are chosen, each of relatively small capacity. They are especially designed to withstand high temperature, being insulated with mica and asbestos. The continuous rating of each motor at 1,000 volts and with 120 deg. rise by resistance is 266 hp., corresponding to 3,500 tractive effort at the rim of the drivers at a speed of 28.4 mi. per hr. Forced ventilation is employed for cooling. The armature core is provided with holes for the passage of ventilating air. Ventilating blowers are located above each motor armature and deliver air at the commutator end of the motor where it divides, a part passing through the armature and a part back through and around the field coils where it escapes upwards and is afterwards used for ventilating the starting resistors.



Control Apparatus in Engineer's Cab of the General Electric Locomotive

This type of motor lends itself nicely to simple and compact locomotive design as the frame is made use of to furnish the entire path for the magnetic flux. The pole pieces and field coils are fastened to the cross transoms of the trucks and the magnetic flux passes horizontally in series through all twelve motors, finding a return path through the locomotive frame. The articulation joints between the trucks are made in such a manner that large surfaces are in contact to provide an easy path for the flux. The pole pieces are made flat in order to prevent the pole pieces from coming in contact with the armature during the vertical movement of the truck frame on its springs or when removing or assembling the armatures. A minimum clearance of ⅛-in. on each side is allowed between the armature and the pole piece tips. The brushholders are bolted to the transom allowing the brushes to move up and down with the fields as the frame rides on the truck springs.

View from Engineer's Position on General Electric Locomotive

Control

In choosing the control apparatus special care has been taken to use individual pieces of apparatus best suited to the particular requirements. Where single independently operating switches are necessary as on the resistance notches, electro-magnetic control is used. Where several switches are required to operate at one time as in changing from series to parallel motor connections, banks of switches with electro-pneumatic cam control are used, thus insuring positive operation, eliminating interlocks, and simplifying the wiring.

The control for motoring is arranged for four motor combinations. The first combination has nine rheostatic steps, one full field step, and one tapped field step, with twelve motors in series across 3,000 volts. The second combination has six rheostatic steps, one full field step, and one tapped field step, with six motors in series and two sets in multiple. The third combination has eight rheostatic steps, one full field step, and one tapped field step, with four motors in series, and three sets in multiple. The fourth combination has eight rheostatic steps, one full field step, and one tapped

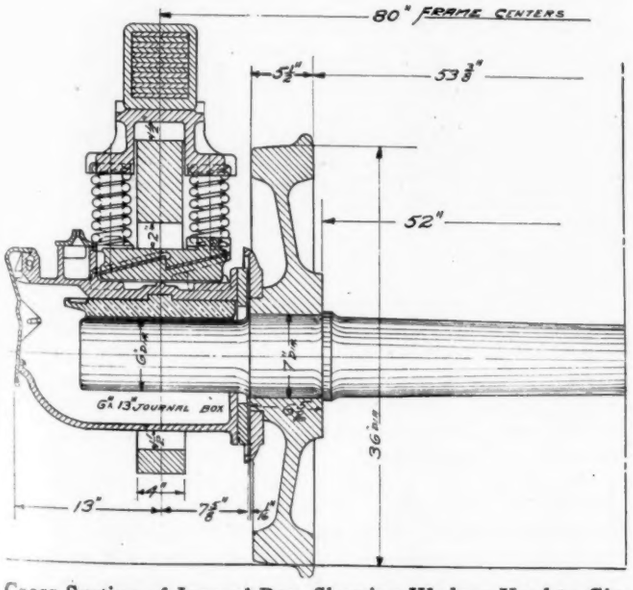
field step, with three motors in series, and four sets in multiple. This results in a total of 39 control steps with a choice of eight operating speeds, exclusive of the resistance steps.

The regeneration of power for braking is accomplished

Interior of No. 2 Apparatus Cab of the General Electric Locomotive with Roof Removed

by using some of the motors for exciting the fields of the others, which in turn are used as generators to return power to the line.

As a provision against short circuits, or extreme overloads,

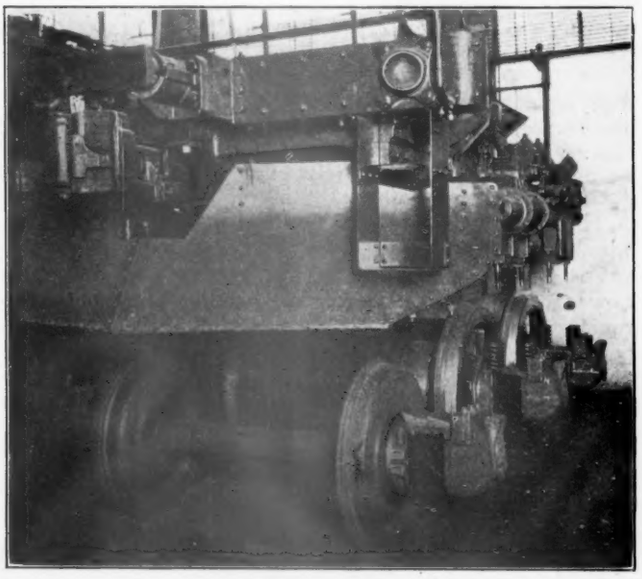


Cross Section of Journal Box, Showing Wedges Used to Give Resistance to Lateral Movement

a quick acting circuit breaker is provided in the apparatus cab which will protect the circuit in less than 1/100 of a second.

Mechanical Construction

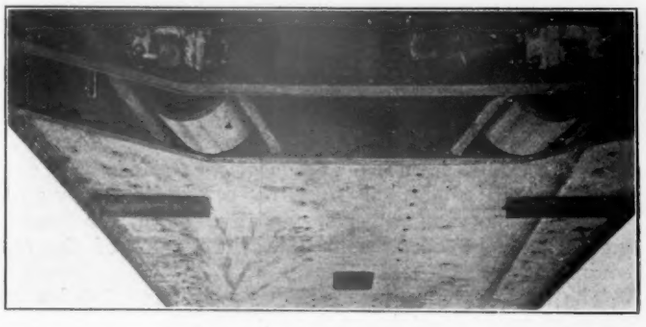
For flexibility in curving, the running gear is made up of four trucks, each of a relatively short wheel base. The two middle trucks have four driving axles each; and the two end trucks, two driving axles and one guiding axle each, making a total of 14 axles. The trucks are connected together with articulated joints which allow of no relative



Leading Truck Partly Assembled, Showing Wedges in Place on Journal of Guiding Axle

lateral movement between them, so that each truck positively leads the following truck.

To soften any lateral blow that may be given against the rail head, the leading and trailing axles are allowed a movement of one-half inch relative to the truck frame, either way from their central position. This movement takes place against a resistance introduced by wedges above the journal boxes which tend to hold the box in its central position and to give a dead beat action opposing the motion. To further protect the track from lateral displacement on the ties, the outer end of the superstructure is carried on rollers, bearing



Platform and Rollers Which Constitute Upper Half of Centering Device

on inclined planes upon the truck frames, while the inner end of the superstructure is rigidly bolted to one of the middle trucks. This construction tends to hold the leading and trailing trucks in their central position. When a blow is delivered by the leading or trailing truck against the rail head, the superstructure, which is rigidly bolted to the middle truck, is displaced laterally across the outer truck very much as a boiler of a Mallet locomotive swings across its leading truck. In such a sideways displacement, the weight of the

superstructure rolls up on the inclined plane on that side, and thus transfers weight to the rail that is affected, thereby increasing the adhesion of the rail to the tie. This action really has two results. It not only increases the holding power between rail and tie at that point, but it introduces a time lag and increases the time and distance during which the pressure is delivered to the rail head.

The Baldwin-Westinghouse Locomotive

By N. W. Storer.

The locomotive is built in a single unit, having one long cab, carried on running gear of the 4-6-2-2-6-4 type. The running gear consists essentially of two Pacific type running gears, coupled back to back.

The side frames are steel castings, joined over the four-wheel trucks by a heavy "A" frame casting; also by heavy cross-ties between the drivers which also support the motors, carry the center pin and carry the coupling between the two running gears. Each half running gear has six spring-supported plungers on which the cab rests. There are two supports at each end and two in line with the center pin. By the use of shims, the distribution of weight between the two ends of each running gear may be adjusted as desired.

The equalization is of the standard three-point type; the leading bogie being cross equalized with the leading pair of drivers and the pony axle being equalized with the two adjacent driving axles on the sides. Extra points are provided in the equalizing levers so that practically any distribution of weight that is desired can be attained.

The driving wheels are 68 in. in diameter; the journals 8½ in. by 14½ in., located outside of the wheels. The drawbars, with Miner friction draft gears, are carried in the "A" frame casting, previously mentioned.

The coupling between halves of the running gear consists of a long bar of a box section. The coupling pins are 10 in. in diameter and are located well inside the pony axles. The pins are hollow, filled with oil-soaked waste and have oil holes provided that keep the pins well lubricated.

The four-wheel trucks are of the "Woodard" type with outside journals; 36-in. rolled steel wheels and cast steel side frames. The journals are 6½ in. by 14 in. The two-wheel truck is of the well known "Rushton" side-bearing type, also with the outside journals and 36-in. wheels. The journals are 6½ in. by 14 in. Brake shoes are provided on all drivers. A modified form of the 14-EL Westinghouse Air-Brake Company equipment is used.

The cab is 78 ft. 0 in. long, 10 ft. 2 in. wide; is strong and rigid so that it can be lifted at the ends. The main strength lies in the two bridge girders extending from end to end. The heavy cross-braces and the side members and top of the raised deck down the middle of the cab, form a construction that is light, but stiff. The cab is divided by cross partitions into compartments, one at each end for the engineer, and the others for the various parts of the cab equipment.

The total motor rating of the locomotive is 4,200 hp. on the one-hour basis. The continuous rating is 3,400 hp.

Driving Motors

The six driving motors are of the twin armature type. Both armatures are contained in a single frame, arranged to secure the maximum economy of weight. The fields are of the standard four-pole type with four salient poles and four interpoles for each armature. There are brush arms on each commutator which are easily accessible. Each armature is wound for 750 volts, but the two armatures and the two sets of field windings are connected permanently in series so that the rating of the complete motor is based on 1,500 volts. The motor is designed for field control by inductive shunts.

Quill Drive

The one hour rating is 700 h. p. The continuous rating is 567 h. p. with forced ventilation and 400 h. p. without blowers. The motors are mounted rigidly on the cross ties of the running gear, one being mounted directly above each driving axle. Each motor is geared to a quill centered in bearings in the motor frame and surrounding the driving axle with a clearance all around when axle and quill are concentric of 1¾ in.

The quill carries the gear and is connected to the drive wheels by long helical springs which are clamped rigidly at the ends in castings which are bolted one to the quill flange and the other to the drive wheel. There are seven springs at each end, worked in compression in one wheel, while those in the other are in tension. All springs with clamps are interchangeable.

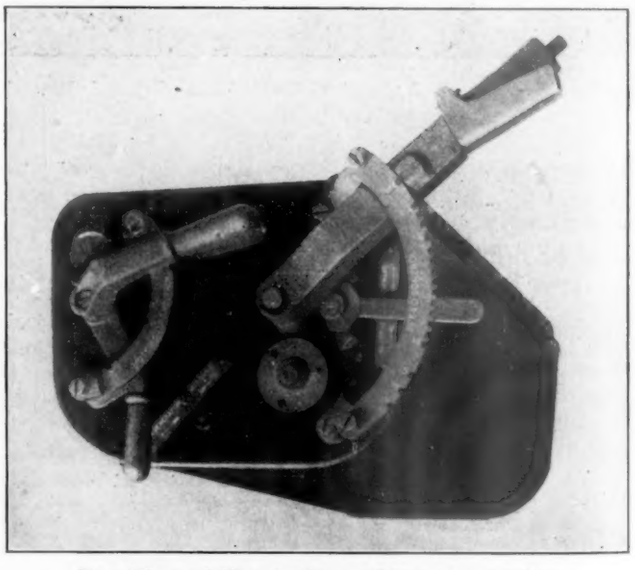
They are easily accessible for inspection, and any spring may be removed without disturbing any other part of the running gear.

Main Motor Control

The six motors are arranged to be connected in three combinations:

1. All in series, giving one-third speed.
2. Three in series, two in parallel, giving two-thirds speed.
3. Two in series, three in parallel, giving full speed.

Inductive shunts are applied to the fields on all three of these positions. Shunt transition is used in passing from one combination to the next. When regenerating, the motors are separately excited from the two axle-driven generators which are carried on the inside axles of the two four-wheel trucks and geared to them like ordinary interurban railway motors These generators are separately excited and the field strength of the main motors is controlled by varying the fields of the exciters.



Top View of Westinghouse Master Controller

The scheme that is used for regeneration includes the use of stabilizing resistance, which is connected in series with the exciter armature, main motor field circuit, and also with the main motor armature circuit, so that the field excitation is dependent, to a certain extent, on the armature current.

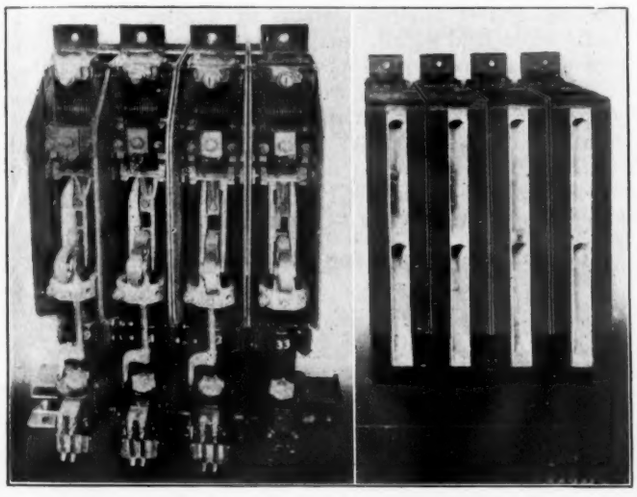
The master controller has four control drums and four operating handles.

1. The speed drum, which controls the resistance switches and line switches; field shunts during motoring and the exciter voltage during regeneration.

2. The reverser drum, which perform the usual function.
3. The motor combination drum, which has three positions, each corresponding to one of the three motor combinations.
4. The regenerative drum, which changes the connections from motoring to regenerating and vice-versa.

The master controller is arranged so that the controller may be thrown from the "off" position to the second or third speed combination, if desired, without passing through the lower combinations.

The engine-man is prevented from accidentally starting the locomotive from rest, in the second or third combination, by an interlock in the controller which prevents the line switches from closing when the motor combination lever is in the second or third position, unless he pushes a button in the top of the master controller. It is, therefore, necessary when applying current with the locomotive at speed, to press the button when it is desired to go immediately into the second or third combination.



Rear and Front Views of Four High Voltage Unit Switches

There are thirteen resistance steps, all of which are available in both first and second speed combinations. On the third combination, there are ten steps that are useful; making a total of thirty-six resistance steps and two field shunting notches in each combination, or a total of forty-two steps in the master controller.

The main resistance is arranged in three groups, each of which has five switches, each short-circuiting a section of resistance. These three groups are connected all in series for the first combination, and three in parallel for the second and third combinations. The sequence of closing the resistance switches is the same on all combinations. The resistances are always connected in series before the master controller reaches the "off" position. The overload trips are arranged to open the resistance switches and insert the entire resistance in series before the line switches are opened.

Switches

The unit switches are numbered from "1" to "33." Each switch is provided with a very powerful magnetic blowout with arc chutes of arc-resisting material, and an arc splitter. It is electro-pneumatically operated and is designed so that it is very thoroughly protected from insulation troubles and for ease of inspection and over-hauling.

The cam switches are designated by numbers and letters. The number corresponds to the group in which the switch is placed and the letter corresponds to the particular switch in the group.

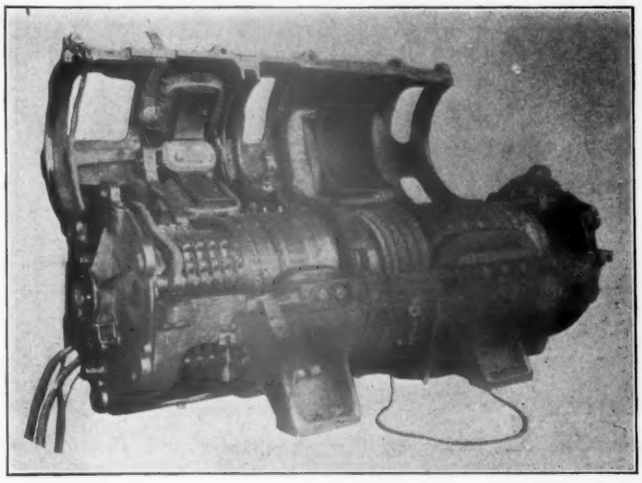
Those of Nos. 37 and 38, which are the groups operating the field shunts, also Nos. 39 and 40 which control the stabilizing resistance during regeneration, are provided with magnetic blowout; but the switches for the reverser, which never close or open the circuit with current on, have no arc chutes or blow-outs. Groups Nos. 34 and 35, which make the different motor combinations, have barriers placed between adjacent switches which have a large difference in potential, but no magnetic blow-out, since these switches are never used for opening the circuit under load. The groups are operated electro-pneumatically.

Auxiliaries

Power for the auxiliary motors, control circuits, train lighting, motor excitation, etc., is derived from three sources:

1. *Motor-Generator.* The motor of the set receives current from the line; the generator delivers current at a constant voltage of 85. This is required primarily for train lighting.
2. *Storage Battery.* This consists of MV-25 ironclad Exide type containing 38 cells. The battery has a capacity of 300 amperes for approximately one hour.
3. *Two Axle-driven Generators.* These generators are designed primarily to furnish current for exciting the main motors during regeneration.

The storage battery is always available to supply current for locomotive lights, control circuits, and the air-compressor motor for short periods. When the locomotive is in service, the generator of the motor-generator set is always in parallel with the battery, and from this dual source is always taken the power for lighting the locomotive and train, control circuits, cab floor-warmers, small blower motors for inductive field shunts, boiler blower and exciting current for the axle generators. In addition, the current for the air-compressor motor is supplied from this dual service whenever the locomotive is standing still or regenerating.



Westinghouse 3000-Volt, 85-Volt Motor Generator Set

The axle generators are, as stated, used primarily for exciting the main motors during regeneration. At other times, when the locomotive is in motion, the axle generators are automatically connected to the auxiliary circuits from which the compressor and main blower motors take power. At this time the voltage is automatically maintained at 90.

A two-stage compressor with inter-cooler, having a displacement of 150 cubic feet per minute, is provided. It is a double-acting, upright type, driven by an industrial type motor.

Two blowers are provided to supply forced ventilation to the driving motors. They are driven by motors that are duplicates of the compressor motor.

The axle generator circuits are shifted from one circuit

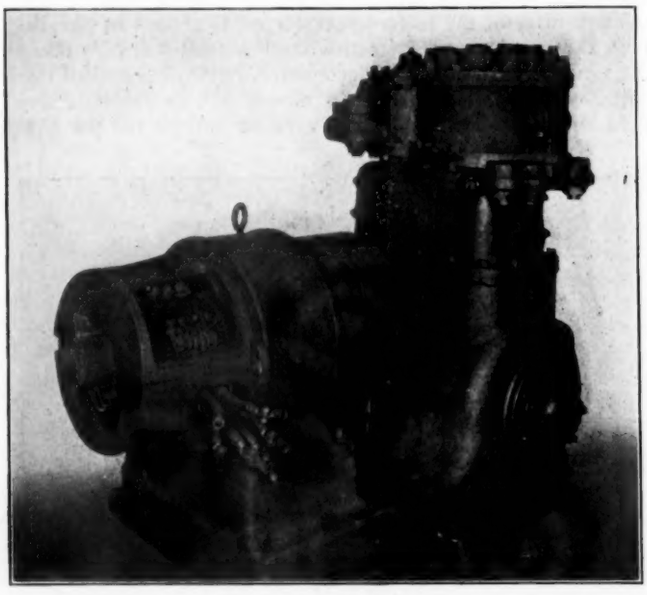
to another by a group of the same type of cam operated switches as are used in the main motor circuits. The field rheostats for the generator of the motor-generator set and the axle generators are operated by small motors. As the fields of the two axle generators are connected in series, only one rheostat is required for them.

The switches for controlling the blower and compressor motors and the high-voltage motor are magnetically operated.

The motor of the motor-generator set is protected from overload or short circuit by a small permanent resistance in series and a set of three expulsion type fuses which blow in series, the first two inserting additional resistance in the circuit, and the last opening only after a relatively high resistance has been inserted and the current consequently limited to a low value.

A Sangamo wattmeter is provided which has separate dials for integrating the motoring watts and regenerating watts. A full set of motor ammeters is provided, and also a voltmeter reading line volts. An ampere-hour meter is provided for the storage battery.

A boiler with a capacity for evaporating 4,000 lb. of water per hour is provided for heating the train and engine-man's cab. The boiler and water storage tanks are located in the middle of the cab and occupy a relatively large proportion of the space. The tank for fuel oil is located directly beneath



Air Compressor Driven Through Gears and Cranks by 30 HP. Motor

the boiler, and the water tanks, two in number, just fore and aft of the boiler.

Two pantagraphs of the double sliding shoe type are provided. These are raised by air and lowered by gravity.

All cable is in steel conduit, and all exposed connections are solid copper bar or strap.

Mechanical Design

This locomotive has been designed to possess certain mechanical features which have developed through years of experience with steam locomotives. The cab has the boiler, water and oil tanks, storage batteries, air-compressor, resistors, motor-generator set, and the heavier parts of the control equipment, concentrated between the center pins. The driving motors are mounted above the axles on the running gear, thus getting the weight well inside the wheel base, but placing it relatively high. The height of the center of gravity of the complete locomotive is 68 in., a value that corresponds well with that of a steam locomotive. The height of the center of gravity of trucks with motors mounted is 43¾ in.

The quill drive, which is a further development of the one used on the New Haven locomotives, gives each driving axle perfect freedom to move vertically the full distance permitted by pedestal jaws without affecting the motors or frames, except through springs. The only "dead" weight carried is the weight of the wheels, axles, journal boxes and spring clamps; a total of 7,032 lb. for the wheels, axles and spring clamps which are rigidly fastened together, and 770 lb. for the journal boxes. This weight with the larger diameter of drivers (68 in.), and the total weight of 56,000 lb. per axle, gives a combination that is much better than has been considered very good practise on steam locomotives.

The cab rests on spring-supported plungers which are in series with the main semi-elliptic springs. The cab is protected against bumping strains by floating center pins, which, while held rigidly against lateral motion, are cushioned against longitudinal motion by heavy springs. It has been the practise heretofore with this general type of locomotive to have one center pin rigid in the running gear frame and allow the other one to move freely in a longitudinal direction. It is felt that it is much better to allow a slight relative motion between the two center pins, but to prevent the bumping shocks by spring cushioning.

Comparative Data for the Two Locomotives

	General Electric	Westinghouse
Total weight	521,200 lb.	550,000 lb.
Total weight on drivers	457,680 lb.	336,000 lb.
Non-spring-borne weight per driving axle	9,500 lb.	7,800 lb.
Length over-all	76 ft. 0 in.	88 ft. 7 in.
Height over cabs	14 ft. 11⅝ in.	14 ft. 6 in.
Height over pantograph, locked down	16 ft. 8 in.	16 ft. 7⅞ in.
Total wheelbase	67 ft. 0 in.	79 ft. 10 in.
Maximum rigid wheelbase	13 ft. 9 in.	16 ft. 9 in.
Diameter of driving wheels	44 in.	68 in.
Diameter of idle wheels	36 in.	36 in.
Heater capacity	4,000 lb. steam. per hr.	4,000 lb.
Water capacity	30,000 lb.	25,500 lb.
Oil capacity	6,000 lb.	750 gal.
Compressor capacity	150 cu. ft. per min.	150 cu. ft. per min.
Number of motors	12	12
Type of motor	(Bi-polar) GE-100	(Twin) 4-pole

	General Electric		
Locomotive rating:	Tapped field	Full field	Westinghouse
Total horsepower, one-hour motor rating	3,480	3,380	4,200
Total tractive effort one-hour motor rating	36,000	46,000	66,000
Speed, miles per hour	36.2	27.5	23.8
Total horsepower continuous	3,200	3,200	3,360

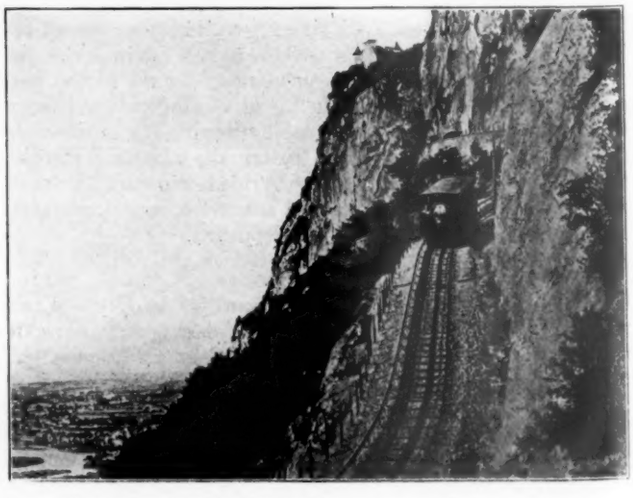


Photo from International Film Service

The Cog Railway Making Its Way up the Pilatico, an Offset on the Alps on the Borders of the Cantons of Lucerne and Unterwalden

Automatic Train Control at New York Railroad Club

Address by H. S. Balliet—Comments by Messrs. Ames, Borland, Sprague and Others

THE REGULAR MEETING of the New York Railroad Club, held in New York on March 19, was devoted to a discussion of the automatic train stop, the principal paper being by Herbert S. Balliet, terminal manager, Grand Central Terminal, New York, who was a member of the United States Railroad Administration's recently disbanded committee on that subject. Mr. Balliet's paper, the first one abstracted below, was mainly a precis of the report of that committee. Other papers were presented by Major Azel Ames, of the Kerite Insulated Wire & Cable Company, formerly a member of the Block Signal and Train Control Board of the Interstate Commerce Commission; by W. P. Borland, chief of the bureau of safety of the Interstate Commerce Commission, and by Frank J. Sprague, the well-known electrical engineer of New York City, who has devised an automatic train control system and who some months since made arrangements—interrupted by the war—for testing his apparatus on the New York Central. His laboratory exhibit has been examined by the Railroad Administration committee.

Addresses and remarks less formal than the preceding were made by J. M. Waldron, signal engineer of the Interborough Rapid Transit Company, New York City; Charles Stephens, signal engineer of the Chesapeake & Ohio and one of the developers of the train control system of the American Automatic Train Control Company, now in use on the Chesapeake & Ohio; Calvin W. Hendricks, president of the American Automatic Train Control Company, and J. Beaumont, representing the Casale Safety Device Company, proprietor of an automatic stop now in use on the Chicago, Rock Island & Pacific, between Blue Island, Ill., and Joliet.

Mr. Balliet's Paper

To the average observer the distance from the air brake of a moving train to the roadway beneath is but a matter of feet and inches. To those persons interested in the art of automatic train control, however, it is a formidable interval of space that cannot be measured in ordinary units of magnitude. A few inventors have been fairly successful in establishing communication. They are the ones who have paid proper attention to laws of mechanics, electrics and pneumatics, and have brought the light of scientific research and practice to bear on the problem. The earliest record of an effort to undertake communication with or from moving trains is Pohl's patent, dated January 11, 1859, proposing a method of enabling moving railroad trains "to telegraph their own passings at certain stations." Wallwark, on January 29, 1867, was granted a patent "for applying to the track an adjustable incline plane, and applying a plunger and lever to the locomotive and connecting the lever to the throttle valve and alarm whistle in such a manner that when the incline plane on the track is adjusted in a certain position the plunger on the locomotive passes over the incline plane," is moved or actuated so as to cut off the steam and sound the whistle. . . . The first air brake was invented by Westinghouse in 1869 and other profitable use of automatic train control devices was not available until the brake was developed.

While there are in use in this and other countries stop and automatic train control systems, not one of them meets the specification contained in the presentation following. . . . The transmission of "information" for the control of the train and air brake, from the roadside, is the problem, and is difficult of solution. There are available, for test purposes, 17 devices. Actual road installations must be made to prove their usefulness. It is not difficult to apply devices on the roadside to stop the train. It is, however, very difficult to install automatic train control to meet the operating conditions. If you only stop your train, then you must sacrifice track. Automatic train control with speed control must maintain, in block signal territory, existing operating requirements, and if possible increase track capacity and provide greater safety.

[The speaker then went on to outline the requirements as laid down in the report of the Automatic Train Control Committee of the United States Railroad Administration, noticed in the *Railway Age* of January 16, page 227.]

The installation of automatic stops and automatic train control devices should be made with complete track circuit control and a [visual] signal system controlled by the same track circuit. Experimentation with or adaptation of some form of train control device without the signal system is inconsistent with good operating requirements. The practical development of automatic train control devices and their use to supplement existing automatic block signals for the purpose of compelling obedience to signal indications is highly desirable. . . . Failure to obey signal indications that are seen and understood are rare, and include only those cases where enginemen in their anxiety to make time take chances, or where they use poor judgment in the interpretation of rules which permit them to exercise some discretion. The problem comprises two main elements, one of which consists in reproducing upon a moving train, either by mechanical or electrical means, a correct indication of the condition of the track ahead; the other requires proper means for controlling the train in obedience to the indication given. Important factors entering into the problem are: (a) Reliability in operation, (b) inspection and maintenance. Proper inspection and maintenance will be more difficult than the inspection and maintenance of track circuit controlled signals, for the reason that part of the apparatus will be located on the roadside and another part upon the train. (c) Clearance. Clearances are materially affected by tunnels, bridges, station platforms, track pans, grade and highway crossings, etc. (d) Capacity; the effect upon the traffic handled over a given section of railroad: A properly operated automatic block signal system adds to the capacity of a railroad by increasing the freedom and flexibility of train movements over it. This condition should not be unduly interfered with by the use of an automatic train control device. It is apparent, however, that if such a device is to act to stop a train only in the occurrence of those emergencies caused by failure to obey signal indications, the automatic brake application must be made a sufficient distance away from the actual point of danger to bring the train to a stop before reaching the point, under the most unfavorable conditions. This involves the necessity of providing maximum braking distance for all trains equal to that required for *any train*. This cannot be done without decreasing the track capacity, and on congested railroads is therefore a matter for serious consideration. To overcome these difficulties permissive features have been installed to enable the engineman to nullify the brake application; and speed-control apparatus is being developed.

(e) Interchangeability as between different devices on track used by railroads jointly is essential in many cases to

economical operation. This practice, as well as the joint use of terminal facilities, has been extended during the past two years, and will, without doubt, become more general. It is necessary, therefore, that automatic train control devices shall be so designed that the engine equipment of the various lines will properly function with the roadside apparatus on tracks used jointly.

This requirement does not refer to detouring in case of accidents, making it necessary for the trains of one company to move over the tracks of another. Such movements are handled by a qualified employee of the owning road. . . . (f) Co-relation with track circuit controlled block signalling and air brake apparatus. It is essential that automatic train control apparatus shall be so designed that it may be superimposed upon the block signal system and not interfere with the performance of the signals.

The cost of an automatic train control system is an undetermined item which involves not only the original expense of installation but also the cost of maintenance and the effect of its operation upon the capacity of existing facilities. If a device materially reduces the capacity of a railroad, its installation where heavy traffic is handled may necessitate further expenditure for additional running tracks. . . .

The Reliable Machine Versus the Unreliable Man

Major Azel Ames, the well-known engineer, formerly in the service of the New York Central and a member of the government Block Signal and Train Control Board (1907-1912), presented a carefully prepared discussion of Mr. Balliet's paper, comparing the automatic stop problem with cognate problems in other lines of industry. An abstract of his address follows:

The automatic train-control problem, as I have observed its development for about fifteen years, seems to be divided into four parts. Railroading, as compared to many of our industrial arts, is relatively an old art, about a hundred years old in fact, and started in a time of less rapid development than some of the younger arts. Compare the control of railroad trains with the control of electric current for power and lighting and with one aspect of the fire protection problem. In electric light and power practice it would not be attempted to protect the apparatus and circuits by installing devices to indicate visually or audibly that an overload was occurring and expect the attendant to pull the switch and open the circuit when these devices indicated an overload. It is true that there is always a man on the job, and it is his business to watch his meters and to open the switches when occasion demands; but no one responsible for the operation of an electric power plant would omit the installation of automatic circuit breakers which would, if an overload occurred, open the circuits without the intervention of the attendant. He would not depend upon the human variable. At the same time the human factor is used in a supervisory capacity or in the performance of those acts which require judgment and variety in action to suit variety in conditions. . . . Consider the automatic sprinkler systems in our shops and storehouses. We might install hand-operated sprinklers with thermostats to give some visible or audible indication of fire, but the watchman might not see nor hear the alarm, or he might fall down stairs and break a leg while hastening to the fire. By all means let us have the watchman and, if possible, an alarm system that will wake him up and get him on the job, because he may, by the exercise of some of the God-given powers of the human mind which cannot be exercised by an automatic device, be able to save fire damage and water damage; but in the last analysis the thing that is really going to satisfy the underwriters and insure that the water gets on to the fire is making the sprinklers automatic.

If we consider the sequence of events that must take place between the obstruction of a track on a railroad and the stopping of a train because of this obstruction, we shall find that these events occur substantially as follows:

1. A metallic path is established between opposite rails of the track circuit.
2. A sufficient portion of the track current flows through this shunt to reduce the amount of current through the coils of the track relay below the minimum required to hold its armature attracted.
3. The control circuits of the signals open at the contacts of the de-energized track relay.
4. The line control circuits are de-energized.
5. The slot or holding clear magnets of the signal become de-energized.
6. The mechanical latch or other hold-clear mechanism of the signal releases.
7. The signal arm, under the action of the gravity, assumes the stop position, displaying the stop signal indication.
8. The engineman sees the signal.
9. The engineman senses and interprets its indication.
10. He decides to stop his train.
11. He shuts off the power.
12. He manipulates the air-brake valve handle.
13. An outlet for air-brake pressure to atmosphere is established.
14. The train line air pressure falls.
15. The triple valve operates.
16. Reservoir air is admitted to the brake cylinders.
17. The brake piston, rigging and beams operate to cause application of the brake shoes to the wheels.
18. The energy of motion of the train is converted into heat and the train retarded and finally stopped.

Of these 18 operations all but 5 are automatically performed by mechanical devices without human intervention. In this series of operations otherwise automatic and performed automatically millions of times each year without failure, there are introduced five (Nos. 8 to 12, inclusive) which are susceptible of vitiating the proper accomplishment of the series. It seems remarkable to many persons familiar with the great extent to which other sequential operations in industry are made continuously and completely automatic that the integrity of the sequence of operations required to stop a train, especially in view of the importance they may at times assume, has continued so long to remain subject in such a degree to the chances of human fallibility. (It speaks volumes for the dependability of human agency to perform automatic operations that the results of it in such a chain or sequence have been as reliable as we know them to have been.)

The mechanical events in the series can be depended upon to occur as a consequence of the operation of quite definite and well-known natural laws; but what about items 8 to 12? There is no natural law which will assure that the events to be brought about by the engineman will certainly occur.

When we consider other systems of control used in industry we see that here the *man*, to use the electrical analogy, is put in multiple rather than in series with the *machine*.

The natural division of the automatic train-control problem seems to be into its engineering, operating, legal and financial aspects. Much remains to be done in the engineering field in the way of practical adaptation of methods and devices. Mr. Balliet has well set forth in his paper the operating requirements. There is no reason to believe that they cannot be met with the same degree of success that other combined engineering and operating problems have been met when they become sufficiently pressing to demand the requisite degree of attention for their solution. The principal legal aspect of the problem has been met by the provisions of section 26 of the

transportation act, 1920, which embodies the recommendation of the Block Signal and Train Control Board to the Interstate Commerce Commission in its report to that body made November 22, 1910, to the effect that the partial installation of automatic train control by a carrier should not extend its liability under the use of such systems to portions of its road not so equipped.

This brings us to the most important phase of the whole problem — namely, the financial. We may admit that the installation of automatic train control systems on railroads would be a highly desirable thing. We are not willing to admit that American engineering and operating brains and skill cannot provide anything that American railroads must have to safeguard and facilitate their traffic, but all of these things cost money, and nowadays they cost a great deal of money. The railroad companies, facing today large expenditures for equipment and materials urgently needed, are very much like the Irishman who stood looking into the window of a trunk and bag store presided over by a gentleman of Hebrew extraction. The enterprising proprietor came out, and the following brief but pointed conversation took place:

"Mein frendt, you should py a trunk."

"Pfwat for?"

"Vy, to put your clothes in."

"And go naked?"

As much as we recognize the benefits to be had from the use of automatic train control, we must realize that there are a dozen pressing uses for every dollar that can be obtained. Certainly nothing is going to attract capital more than ability to earn a return. Automatic train-control systems may *save* money in the same way that insurance of other kinds will safeguard it against loss. They will have to be much more highly developed than the extent of their present use would indicate before they can really *earn* money.

Fortunately we have at hand and readily available a class of safety devices fully developed and tried in the fires of experience. While originally looked upon as luxuries and safety devices only, they have fully justified their claims to the title of revenue producers. I refer to the power interlocking plant and the automatic block signal. Steam locomotives and most other major railroad facilities have introduced few radically new problems. Development has been mostly along the lines of increased size and refinement of design.

The automatic block signal and the interlocking plant, however, were created almost "de novo" to meet definite demands and I believe have done more than any mechanical or electrical improvements that have been introduced on our railroads since the invention of the telegraph and the air-brake not only to save money but to earn money. The air-brake and the telegraph, or its complement, the telephone, are in use on practically every mile of railroad in the land. There are thousands of miles of line in this country today operating without any space interval block system whatever. On these lines money spent for good signalling will probably give as large a return in safety and increased earning power as any expenditure that can be made. It may even earn enough to buy automatic train-control systems, but we need clothes just now, much more than we need a trunk to put them in.

From the Government Viewpoint

By W. P. Borland

Mr. Balliet leaves little room for discussion. He has enumerated certain well-recognized features of the train-control problem without giving us any indication of the possibility of its solution. As secretary of the Block Signal and Train Control Board of the Interstate Commerce Commission, I began study of the automatic train-control problem in 1907 from the basis of a somewhat extended train-service experience in the cab of a locomotive, and since 1912 I have had charge of the investigations and tests that have been conducted by authority of the Interstate Commerce Commission, so I have naturally absorbed some information touching the practical aspects of the problem, and I have found no reason to disagree with certain propositions which were laid down by the Block Signal and Train Control Board in its fourth annual report, December 28, 1911.

[These propositions are to the effect that the art of automatic train control is far enough advanced to warrant further development; that railroad engineers have already manifested adequate ingenuity, and that if the railroads had been as energetic in this line as they have in interlocking and block signaling we should now find automatic train stops already in use; and that in particularly dangerous locations railroads would have no difficulty in complying with reasonable requirements for the use of train control.]

In its final report, June 29, 1912, the board concluded that "the development of the automatic stop has proceeded far enough to warrant the expectation that by its use greater safety can be assured in the operation of trains." The commission's Bureau of Safety has on numerous occasions recommended the installation of automatic train control devices for development.

Now, in 1919, the Automatic Train Control Committee of the Railroad Administration tells us that the devices available for use are still in the development stage. The only reasonable conclusion that can be reached, in view of the 13 years of progress thus briefly sketched, is that without the compulsion of positive law, which is now, fortunately, provided in the new railroad statute, train control devices would continue in the development stage indefinitely. . . . That there are problems in connection with the application of any automatic train control device anyone will readily concede. But this is true of any engineering project involving research work and the application of tried and tested apparatus for new purposes or in new fields. The tests conducted by the commission during the past 12 years of 16 or 18 different devices have resulted in the accumulation of a large amount of reliable data, notwithstanding many adverse conditions. The proprietors of some devices were men without extensive resources or backing, and others had no special engineering talent. In one instance a centrifugal governor employed to control electric circuits was mounted in a housing on a tender axle. The locomotive in this instance was assigned to local freight service, and frequently when the engine returned to the roundhouse essential parts of the device would be found disconnected or at the bottom of the box. In another instance a relay mounted in the locomotive cab was shaken to pieces when the locomotive had run less than a hundred miles. It manifestly would be improper for the engineers of the commission actively to assist in the development of any particular device, and a spirit of careless indifference or even of thingly-veiled antagonism too often characterises the attitude of railroad officers. . . . But the proprietors of several of these inventions are not signal engineers and have not consulted signal engineers. They are often more concerned about convenient locations and the accomplishment of certain specified functions of the devices than in conforming to recognized good signaling practice. Notwithstanding all difficulties, the results of a number of these tests have been encouraging. The tests have demonstrated that it is entirely possible to accomplish the intended functions of automatic train control devices under service conditions.

There are now two distinct steps which should be taken. The first is the construction of apparatus properly designed for the service and to accomplish the functions intended; the second is the application of these devices on a more comprehensive scale to varied railroad operating conditions. These are purely engineering problems, and it cannot be maintained that they are problems of sufficient magnitude to disconcert

the talent which has produced the reliable automatic block signal and intricate interlocking plants of today.

Mr. Sprague Describes His Proposed Train Control Scheme

Mr. Sprague's paper was an outline of the problem to be dealt with when providing complete automatic control for a railroad of heavy traffic and varied speeds and lengths of trains. He said that he agreed in the main with Mr. Bailliet's requisites except that interchangeability, as between one road and other, was not an essential. He did not describe his apparatus in detail but said that he and his company were prepared both professionally and financially to take up any proposition, in this line, presented by any railroad. He referred to the strength of public opinion and the futility of standing in its way. Commenting on the recently expressed opinion of a prominent railroad president that automatic stops were impracticable and unnecessary he characterized this as the view of a pessimist unacquainted with the details and with the psychology of the locomotive engineman.

Mr. Sprague declared that the subject should enlist the talent of the most competent civil, mechanical and electrical engineers, yet there should be co-operation with the operating men. He passed a mild criticism on the late automatic train control commitee for going too far afield; it was aside from the point for it to recommend the establishment of the space interval, with ordinary visual signals, while neglecting the more advanced improvement which was contemplated by the Congressional act. The declaration of the Train Control Committee, (also voiced by Major Ames) that, with a given amount of money, more useful results could be obtained by installing block signals than by using automatic stops was declared to be an untenable position. He questioned some of Mr. Balliet's statements and doubted whether he (Balliet) was as pessimistic as his statements would indicate.

Following his general observations, Mr. Sprague presented a diagram showing the way in which he intended to attack the problem of train control. Referring to the diagram, he said:

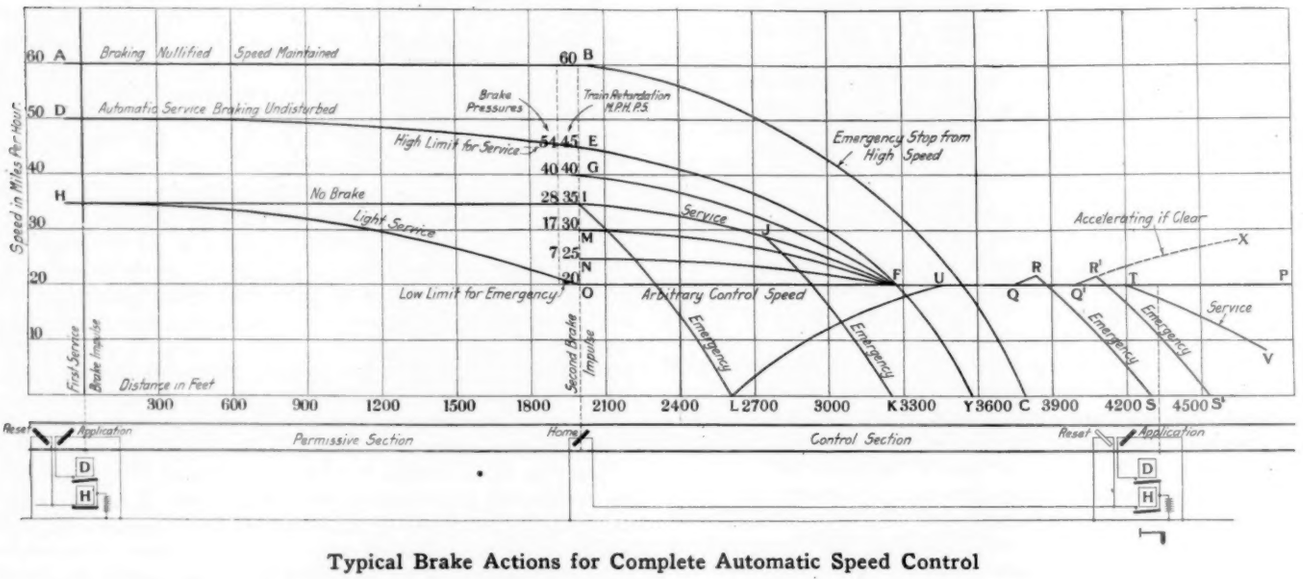
The block is divided into two sections, permissive and controlled, the latter being the section in advance, what we may term the danger zone. In the permissive section the train is left absolutely under the control of the engineer.

The abscissae indicate distance in feet and the ordinates the speed in miles per hour, also variations in service braking pressure, or train retardation from, say, 20 to 45 miles an hour.

The various full lines are the speed diagrams of a number of trains entering the block at various speeds and continuing through under a variety of typical operating conditions.

Along the roadbed, and clear of all equipment limitations, there are provided certain protected track magnets under the full or partial control of the track circuit relays. In each normal block is a brake application magnet just in rear of the entrance, called the "distant" magnet, another at the beginning of the controlled section, called the "home" magnet, these two being similarly positioned, and a third called "reset" magnet, differently positioned near the end of the block immediately in rear of the application magnet of the next advance block. The free fields of the home and the reset magnets, which are normally active, are controlled by the home relay, and the distant magnet by the distant relay, while the magnetic conditions of the home and reset are opposed.

The construction of the magnets is such that while normally active the magnetic field will be cancelled by movement of the relays when the advance block is clear.



Typical Brake Actions for Complete Automatic Speed Control

On the locomotive there are carried suitable receivers which register with the track magnets, but some distance above them, and the necessary relays, air valves and means for initiating both service and emergency braking.

First, let us consider a train entering the block against a distant signal indication, as say 60 miles an hour. It will receive, as would any train visible, audible and touch-responsive signals which will clearly indicate to the engineer the condition of the advance block. There will also be initiated through the engineer's valve a service brake application, which in rate and amount of air reduction, if undisturbed, is that suited to the particular class of train. Immediately, however, provided the engineer does not attempt to block the initial automatic action, the control of his valve is restored to him before any actual braking takes place; he can accept the automatic braking, or increase or diminish it at will; in short, he can approach the danger zone according to his own judgment, but with full knowledge of the conditions imposed. If he proceeds at undiminished speed, and the advance block is not cleared when he reaches the home magnet, the result will be an emergency brake application, with a minimum loss of air, but effective to bring his train to control speed or stop well within the limits of his

block, as indicated by line *A B C*. He will not be likely to repeat the practice. Having stopped, he is free to start again without leaving his cab, but is limited to control speed until cleared.

Let us consider another man, who comes in at a speed of, say, 50 miles an hour, receives his warnings and permits the automatic service brake to come on, or brakes his train down to a speed of, say, 45 miles an hour by the time he arrives at the home magnet, this being an arbitrary limit from which the train can be safely braked within the limit of distance remaining. If at that time the rate of braking is sufficient to pull his train down to control speed within a definite distance, as will be indicated by a proceed lamp in his cab, then there will be no emergency application of brakes, although a controlled initiation of service braking; and the train can be allowed to come to a stop, according to signal indications and the judgment of the engineer; or having arrived at the predetermined minimum controlled speed he can then proceed at, but not above, that speed, until arriving at the reset magnet near the end of the block. These two actions are illustrated by lines *D E F Y* and *D E F T*. Provision can be made for earlier clearance under certain limiting conditions.

Consider another train entering at about 34 miles an hour and with automatic braking nullified by the engineer. On arriving at the home magnet at this speed, if no manual brake application has been made the engineer will get an emergency brake as indicated by lines *H I L*, but having been brought to a stop he can then accelerate and proceed throughout the rest of the block; but only under control speed limit, as indicated by lines *L U T*.

If, however, the engineer manually applies his brakes prior to reaching the home magnet, his wayside signal indicating the necessity for so doing, and the braking is sufficient for that particular train speed to pull it down to control within a reasonable distance, then there will be no emergency brake application, as indicated by lines *J I F T;* but if he attempts to beat the operation while slowing down before reaching the control speed he will get an emergency, as indicated by the lines *J K*.

And so with any other train arriving at a live home magnet at any other speed below the maximum for manual braking. If the manual application made, its sufficiency being indicated by the appearance of a "proceed" lamp in the cab, is such as is necessary for that particular train speed, then, as indicated by the several lines *E F, G F, I F, M F* and *N F* there will be the normal slow down of the train under manual brake application, without any emergency application, and a possible release of brakes when reaching the low speed limit.

Suppose again that the man who comes in at about 34 miles an hour, or at any other speed, brakes his train down to, say, 20 miles an hour, and then continues under control speed, he will receive no emergency brake application at the home magnet even without further manual braking, but in any case if he attempts, before reaching the end of the block, to accelerate above the control speed he will get an emergency application, as indicated by lines *Q R S;* if the advance block is clear then as soon as a reset magnet has been reached he is free to accelerate.

What is thus accomplished and how? There has been established at the entrance and throughout the danger zone a condition in which the coming on of the emergency brake is determined by the co-ordinated action of the two devices, the only ones necessary but both vital. One of these responds to train speed and the other to train braking or retardation, no matter how affected and measured, whether by the pressure in certain parts of the locomotive air system, safeguarded by certain air connections, or by a mechanical element which functions as the integration of all forces affecting retardation. In addition there is provided a complete warning and protection for the train throughout the permissive section of the block—all without unnecessary track capacity handicap—in fact, with an augmentation of capacity.

Comments By Other Speakers.

Mr. Waldron presented a brief sketch of the use of automatic stops on the Interborough Rapid Transit Lines, New York City, where beginning in 1904, the tracks, signaling and other facilities have been expanded until today there are over 2,000 automatic stops in use.

Mr. Stephens described very briefly the installation on his road, which is on the line between Gordonsville, Va., and Charlottesville. He said:

"This installation covers the 21 miles of single track, main line, over which our most important passenger trains are operated. It is designed on the absolute-permissive principle, giving absolute protection for approaching trains, and permissive protection for following trains. The indications are given by three-position colored light automatic signals; and the 40 engines operating over this territory are fully equipped with the train control device. There are no speed control features, but we have met all the other requisites of the Railway Signal Association and Automatic Train Control Committee. We meet several other important requisites that have not as yet been required by these bodies.

"After five years of development we have a satisfactory and safe train control installation. This, of course, could not have been accomplished without considerable cost to the railway company.. We are, however, satisfied with the results, namely: The elimination of the manual block. A considerable increase in train movements and a large decrase in overtime for train crews. A four-minute interval with clear blocks for following movements. A positive check on the automatic block signal.

"The Automatic Train Control Committee and the former Train Control Board called for a more conciliatory spirit towards the development of automatic train control. The president of the Chesapeake & Ohio had the great moral courage to do this; and yet the late lamented Automatic Train Control Committee for some reason did not even give him favorable mention."

C. W. Hendricks, president of the American Train Control Company, spoke briefly of the long series of experiments which have been made in the development of his apparatus on the Chesapeake & Ohio. His concern had kept up courage in spite of disheartening circumstances and neglect by the public; but he congratulated himself and the public that at last Congress, which registers the will of the people, had seen the light, and passed a law (Section 26 of the Transportation Act.).

Mr. Beaumont sketched briefly the operation of the Casale device on the Rock Island road, emphasizing particularly the speed control arrangement which is an ordinary centrifugal governor fixed on the end of the axle of the pony truck of the locomotive. This governor works with great accuracy. The speaker questioned numerous statements made by Mr. Balliet declaring them far too conservative. He said that in his experience, covering 20 years in the signal department, he had found that the need of an automatic train control existed everywhere; all locomotive runners are subject to the human frailty which results in overlooking signals. Young runners, suddenly called upon to take an important train, are liable to have an uncontrollable ambition to beat the record of the regular man. The speaker had known hundreds of cases of enginemen running past stop signals *where no collision followed,* but this is a safety record due entirely to good luck; the true way to secure real safety is to provide mechanical means to prevent disastrous consequences from these incurable man failures.

Mr. Beaumont called attention to the deceptive nature of

the statement that less than six per cent of the fatalities to persons on American railroads (other than trespassers) were due to collisions. Instead of dealing with percentages we should fix our attention on the fact that in ten years 3,000 persons had been killed in the United States in rear and butting collisions; and that $25,000,000 worth of property had been destroyed in such collisions. Let us forget the six per cent and consider rather the shining names of the men whose lives have been snuffed out in notable collisions, such as Mr. Melcher, Samuel Spencer, and others.

Report of Industrial Confidence

THE INDUSTRIAL CONFERENCE called by President Wilson, which since December 1 has been engaged in considering plans for the prevention and adjustment of industrial disputes between employers and employees, on March 21 issued its final report, which makes no recommendation of a plan to cover steam railroads and other carriers because of the recent legislation on that subject enacted by Congress in the Esch-Cummins law.

The conference now proposes joint organization of management and employees as a means of preventing misunderstanding and of securing co-operative effort. It has modified the tentative plan of adjustment issued on December 19, so as to diminish the field of arbitration and enlarge the scope of voluntary settlement by agreement. As modified the plan makes machinery available for collective bargaining, with only incidental and limited arbitration. The conference has extended the plan to cover disputes affecting public utilities other than steam railroads and it has enlarged it to cover the services of public employees.

"The causes of industrial unrest are many," the report says in part. "Among others they include the rise in the cost of living, unrestrained speculation, spectacular instances of excessive profits, excessive accumulation and misuse of wealth, inequality in readjustments of wage schedules, release of ideas and emotions by the war, social revolutionary theories imported from Europe, the belief that free speech is restricted, the intermittency of employment, fear of unemployment, excessive hours of work in certain industries, lack of adequate housing, unnecessarily high infant mortality in industrial centers, loss of personal contact in large industrial units and the culmination of a growing belief on the part of both employers and employees that a readjustment is necessary to a wholesome community of their united effort.

"For the most part causes of unrest are not the result of the war; they have been accentuated by it. Much investigation and public discussion have been devoted to these matters. The conference has made suggestions for dealing with some of the conditions enumerated, and it hopes that progress toward remedying them may be accelerated by the further development of employee representation and by the use of the suggested machinery for adjustment.

"There is, however, a feature of the present industrial unrest which differentiates it from that commonly existing before the war. It cannot be denied that unrest today is characterized more than ever before by purposes and desires which go beyond the mere demand for higher wages and shorter hours. Aspirations inherent in this form of restlessness are to a greater extent psychological and intangible. They are not for that reason any less significant. They reveal a desire on the part of workers to exert a larger and more organic influence upon the processes of industrial life. This impulse is not to be discouraged but made helpful and co-operative. With comprehending and sympathetic appreciation, it can be converted into a force working for a better spirit and understanding between capital and labor, and for more effective co-operation.

"The wisest suggestions for the prevention and relief of industrial unrest are to be found by interpreting the best thought and experience of those employers and employees who, within the area of their own activities, have most successfully dealt with the problem. The conference in making its final report has considered the interpreting of actual achievements its most useful function. It believes that practical experience is more useful than the views of extremists on either side. Such experience shows that no group of men can successfully undertake to deal with the interests of other groups without their co-operative participation in the methods of equitable adjustment.

"The guiding thought of the conference has been that the right relationship between employer and employee can best be promoted by the deliberate organization of that relationship. That organization should begin with the plant itself. Its object should be to organize unity of interest and thus to diminish the area of conflict, and supply by organized co-operation between employer and employees the advantages of that human relationship that existed between them when industries were smaller. Such organization should provide for the joint action of managers and employees in dealing with their common interests. It should emphasize the responsibility of managers to know men at least as intimately as they know materials, and the right and duty of employees to have a knowledge of the industry, its processes and policies. Employees need to understand their relation to the joint endeavor so that they may once more have a creative interest in their work.

"Industrial problems vary not only with each industry but in each establishment. Therefore, the strategic place to begin battle with misunderstanding is within the industrial plant itself. Primarily the settlement must come from the bottom, not from the top.

"The conference finds that joint organization of management and employees where undertaken with sincerity and good will has a record of success. The general principles governing such organization are dated at length under the title, 'Employee Representation.' It is not a field for legislation, because the form which employee representation should take may vary in every plant. The conference, therefore, does not direct this recommendation to legislators but to managers and employees.

"If the joint organization of management and employees in the plant or industry fails to reach a collective agreement, or if without such joint organization, disputes arise which are not settled by existing agencies, then the conference proposes a system of settlement close at hand and under governmental encouragement, and a minimum of regulation. The entrance of the government into these problems should be to stimulate further co-operation."

The system of settlement proposed consists of a plan, nation wide in scope, with a National Industrial Board, local Regional Conferences and Boards of Inquiry, as follows:

1. The parties to the dispute may voluntarily submit their differences for settlement to a board, known as a Regional Adjustment Conference. This board consists of four representatives selected by the parties, and four others in their industry chosen by them and familiar with their problems. The board is presided over by a trained government official, the regional chairman, who acts as a conciliator. If a unanimous agreement is reached, it results in collective bargain having the same effect as if reached by joint organization in the shop.

2. If the Regional Conference fails to agree unanimously, the matter, with certain restrictions, goes, under the agreement of submission, to the National Industrial Board, unless the parties prefer the decision of an umpire selected by them.

3. The voluntary submission to a Regional Adjustment Conference carries with it an agreement by both parties that

there shall be no interference with production pending the processes of adjustment.

4. If the parties, or either of them, refuse voluntarily to submit the dispute to the processes of the plan of adjustment, a Regional Board of Inquiry is formed by the regional chairman, of two employers and two employees of the industry, and not parties to the dispute. This Board has the right, under proper safeguards, to subpoena witnesses and records, and the duty to publish its findings as a guide to public opinion. Either of the parties at conflict may join the Board of Inquiry on giving an undertaking that, so far as its side is concerned, it will agree to submit its contention to a Regional Adjustment Conference, and, if both join, a Regional Adjustment Conference is automatically created.

5. The National Industrial Board in Washington has general oversight of the working of the plan.

6. The plan is applicable also to public utilities, but in such cases, the government agency, having power to regulate the service, has two representatives in the Adjustment Conference. Provision is made for prompt report of its findings to the rate regulating body.

7. The plan provides machinery for prompt and fair adjustment of wages and working conditions of government employees. It is especially necessary for this class of employees, who should not be permitted to strike.

8. The plan involves no penalties other than those imposed by public opinion. It does not impose compulsory arbitration. It does not deny the right to strike. It does not submit to arbitration the policy of the "closed" or "open" shop.

"The plan is national in scope and operation, yet it is decentralized. It is different from anything in operation elsewhere. It is based upon American experience and is designed to meet American conditions. It employs no legal authority except the right of inquiry. Its basic idea is stimulation to settlement of differences by the parties in conflict, and the enlistment of public opinion toward enforcing that method of settlement."

Report on Onawa Collision.

THE INTERSTATE COMMERCE COMMISSION has issued a report, dated January 17, and signed by W. P. Borland, chief of the Bureau of Safety, on the butting collision which occurred on the Canadian Pacific near Onawa, Maine, on December 20, 1919, when 19 passengers and 4 employees were killed, and 59 passengers and 9 employees were injured.

This collision was reported in the *Railway Age* of December 26, page 1256; January 30, page 342, and February 13, page 496. The government report says nothing about injury by fire either to property or to persons, and in other particulars differs from the accounts published at the time of the collision.

Onawa is on the Moosehead subdivision of the Brownville division of the Canadian Pacific, and extends from Brownville Junction, Me., westward to Megantic, P. Q., 117 miles. For eight miles at the east end there is a "permissive staff block system" and the same for 15 miles at the west end, but for 94 miles the only block system is a rule forbidding a passenger train to follow another passenger train until the leading train has been reported at the succeeding station; but after twenty minutes this space of interval rule may be suspended. Communication from station to station is by telephone.

As already reported, the collision was due to disregard of an order by the men in charge of the eastbound freight which collided with westbound passenger No. 39, third section. The freight, No. 78, first section, had order No. 28 to the effect that third No. 39, westbound, would run five hours late. On reaching Morkill (about ten miles west of Onawa), where it should have waited for the passenger, it received another order, No. 47, to the effect that fourth No. 39 would run eight hours late, but this was mistakenly read as extending the time against the third section, from five hours to eight hours, and so the train proceeded, and the collision followed.

The engineman of the freight was killed but Brakeman Austin testified that he had remarked when he had taken the order "we have eight hours on third 39." Operator Kingdon (at Morkill) delivered the order to an engineman off duty who was on the front step of the caboose of the freight; this engineman handed it to the conductor, who read it carelessly and took it to mean that the third section was eight hours late. The conductor said that he went into the caboose, "glanced over the order" and read it as giving him eight hours against the third section. He so remarked to the flagman, but the flagman also seems to have read the order "getting the impression that the third section was eight hours late." This order read as follows:

> "Train order No. 47.—Third No. 39, eng. 783, late. Fourth No. 39, eng. unknown, run eight 8 hours late, Barnard to Megantic."

The trains met at about 20 to 25 miles an hour.

All of these operations in connection with the order were performed while the train was moving slowly through the side track at Morkill, and it did not make a full stop at the station.

Operator Valley, working days at Morkill, was riding on the freight, this apparently being his regular means of reaching his post of duty at 8 a. m. He thought it very strange that the freight should be given eight hours against third No. 39 when, about a half hour before that it had only five hours against it; and when he got into the office he kept saying to Operator Kingdon that he could not understand the situation; Kingdon, however, made no reply; and after the collision he told Valley that he had not understood what he was talking about.

The freight was reported to the train despatcher from Morkill about 7:02 a. m., having departed at 6:59 a. m., and the despatcher, if he had been following closely these two trains would have seen that a collision was impending and could have stopped third No. 39 at Onawa; and the report says that he was extremely negligent in the performance of his duties. He knew that first No. 78 had entered the side track at Morkill for third No. 39, expecting to meet it there, and then had proceeded without receiving additional time. The despatcher had, at this time, nine trains on his district, but the superintendent of the division is quoted as saying that the despatcher was not too busy to have kept a check upon the freight, so as to anticipate at what point it would or could meet the third section.

The report, in conclusion, attributes the collision to the failure of the conductor and the engineman of the freight. Under ordinary circumstances Operator Kingdon would be subject to censure for not holding the freight until the arrival of third 39; but because of a remark made to him over the telephone by the train despatcher, he is held excusable for believing that the freight conductor and engineman may have had information of which he was ignorant. The engineman on the front step of the caboose of the freight, who received the order from the operator as the train passed, is censored for meddling in a train movement in which he was not concerned, though he gave the order promptly to the conductor.

During the first 15 days of December the average number of trains on this subdivision was 41 daily, and, says the report, it is believed that conditions as a whole warrant the establishment of a block signal system.

THE BUREAU OF NAVIGATION reports 138 sailing, steam, gas and unrigged vessels of 261,959 gross tons built in the United States and officially numbered during the month of February.

General News Department

Frederick K. Bennett, principal assistant engineer of the Minneapolis & St. Louis, has resigned, effective March 15, having been appointed a representative of the American Association of Engineers.

Boatmen in New York harbor who work for railroad companies, about 900 of them, members of the National Association of Masters, Mates and Pilots, are reported to have made an offensive and defensive alliance with the "big four" brotherhoods of railroad trainmen.

The Southern Pacific has offered to enter the port of Houston, Tex. (La Porte), with steamship service if the city of Houston wishes it. The railroad is now building three vessels suitable for the trade at a cost of $4,500,000. One of the vessels will carry 4,000 tons of cargo and the others 6,000 tons.

High discount rates are said to be checking Canadian tourist travel to the United States. Canadians arriving in the United States with $1,000 in Canadian currency are, in many instances, forced to accept a discount rate of 20 per cent. As a result many Canadians who formerly wintered in California have abandoned their trips, traffic officers assert.

The Sacramento Northern has applied to the Railroad Commission of California for authority to operate an automobile freight service between Biggs, Cal., and East Biggs, and also for authority to carry freight by automobile truck between Gridley, Cal., and East Gridley. It is not proposed to carry local freight, but to transport through freight received from its rail line.

Solid trainloads of eggs are now being shipped from California to New York City. This is due to conditions which now permit of eggs being marketed to advantage in the East by large producers. The trains are made up of refrigerator cars and go as manifest fast freight via Ogden, Utah. There were over 3,000,000 eggs in one train of 14 cars that left San Francisco, Cal., on March 8, on the Southern Pacific.

The Southwestern Railroad Executives' Association was formed at St. Louis, Mo., on March 18, at a conference of officers representing the principal railroads in the southwestern group. The organization, it was announced, plans "to advance by co-operation the mutual benefit of all roads; to promote common interests and conserve the welfare of the general public in the southwest." The general headquarters of the association will be located at St. Louis. Officers are to be elected at a later meeting.

The control of the bituminous coal industry by the government is challenged in two suits filed in the United States District Court at Philadelphia on March 21 by the Powhatan Coal & Coke Company and other producers. The plaintiffs declare that it is an injustice to them and against the public interest that the Coal Committee should divert shipments without the consent of the owner, and that the wartime legislation, under which control is now maintained, is now out of date, the war having ended. The court granted a temporary restraining order and ordered a hearing on March 31.

The railway surgeons serving the Southern Pacific, the Western Pacific, the Northwestern Pacific, the Atchison, Topeka & Santa Fe, the Oregon & Washington Railroad & Navigation Company, the Oregon Short Line and the San Diego & Arizona, have addressed a communication to the chief surgeons of those roads asking more compensation for their services. Dr. F. K. Ainsworth, chief surgeon, and manager of the hospital department of the Southern Pacific, asserts that the demands are reasonable and that for the fiscal year 1919 Southern Pacific surgeons received for office, resident and hospital visits, major and minor surgical operations, an average fee of 37 cents.

The Railroad Commission of California recently refused to grant a transportation company a permit to operate an automobile stage line between Yreka, Cal., and Montague, holding that the use of private automobiles and rented cars in passenger and freight service has become so extensive and efficient in Northern California that three-fourths of the business of the Yreka Railroad, which operates between Yreka and Montague, has been lost by that company. In refusing to grant the permit the commission held that any further reduction in passenger traffic which would come about through the establishment of another automobile service in the vicinity would compel the railroad to cease operation.

A considerable number of applications have been made by the railroad companies to the Interstate Commerce Commission for loans from the $300,000,000 revolving fund placed at the disposal of the commission by the new transportation act. The commission has requested the Association of Railway Executives to assist it in apportioning the fund among the railroads, as it is inadequate to meet all the requests made, and Chairman Cuyler of the association has requested the various roads to submit schedules of their requirements, particularly in regard to equipment, so that a scheme of allotment may be drawn up and recommended to the commission in such a way that the fund may be used so as most quickly and effectively to meet the most pressing demands for additions to the country's transportation facilities.

The Public Utility Commissioners of the State of New Jersey have been complained of by the Commissioners of Jersey City (the governing body of that city), in a petition sent to the governor of the state, asking that the utility commissioners be dismissed. The petition fills 27 printed pages and contains 18 charges, among which are: Bias in favor of the Public Service Railway Company and other public service companies, the employment of experts prejudiced in favor of the companies, giving permission for companies to divert money from depreciation reserve fund to pay dividends, discrimination in rate fixing in favor of large and influential corporations against small and uninfluential ones, great delay in important cases, and general vacillation, to the detriment of the public interest in public utility cases.

Commission Modifies Map Order

The Interstate Commerce Commission has issued Valuation Order No. 23, modifying its map order, so-called, so that carriers are relieved from the requirement to file reproductions of maps and profiles with the commission at Washington. Carriers are required to preserve the original tracings in a safe receptacle subject to the inspection of the commission. The original tracings must not be in any way changed, added to, or subtracted from, for the purpose of showing changes in the property. Subsequent changes must be indicated by an independent map or profile, and the fact noted upon the original tracing. Each carrier must file with the commission a certificate showing what maps and profiles have been prepared, and that the same are in accordance with the order of the commission; and also make a similar certificate yearly until all the tracings required have been fully completed in accordance with the map order. Carriers must furnish the commission with blue print or white print copies of original tracings, showing subsequent changes, whenever so required.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY, 1920

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (Inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Norfolk Southern	906	$484,371	$146,848	$743,611	$109,922	$128,494	$11,564	$288,024	$21,393	$559,540	75.24	$184,071	$16,000	$168,045	$209,422
Northern Pacific	6,642	6,119,113	1,503,411	9,451,063	1,087,576	1,592,120	61,062	3,568,261	197,532	6,630,852	70.16	2,820,210	721,177	2,097,753	653,105
Northwestern Pacific	536	303,004	171,004	580,690	126,203	77,372	6,988	248,714	14,020	475,133	81.82	105,557	25,590	79,640	114,376
Northern Alabama	112	102,505	14,530	148,847	39,135	5,102	1,802	57,621	1,487	105,148	70.64	43,699	3,830	39,860	55,193
Oregon Short Line	2,347	2,865,646	532,512	4,168,427	417,947	605,511	24,778	1,184,614	105,644	2,408,740	57.78	1,759,687	214,750	1,544,635	906,928
Oregon-Washington R. R. & Nav.	2,070	1,807,042	522,218	2,900,244	404,075	440,735	29,164	1,106,503	100,934	2,103,317	72.52	796,927	146,000	650,851	498,214
Panhandle & Santa Fe	772	503,198	140,700	768,770	100,252	203,154	4,930	284,661	18,541	610,010	79.34	158,761	20,438	138,306	290,819
Pennsylvania R. R.—Western Lines	1,754	5,232,101	1,838,533	9,506,992	983,235	2,747,617	92,636	4,381,394	221,543	8,507,264	89.48	999,728	347,720	651,823	1,269,991
Pennsylvania R. R.—Eastern Lines	5,372	19,648,534	7,182,727	30,039,973	4,059,612	10,515,252	522,012	16,000,505	825,779	32,531,005	108.29	—2,491,032	912,994	—3,411,681	—3,058,564
Peoria & Pekin Union	19	36,683	4,103	147,228	11,899*	40,999	695	96,405	4,830	154,831	105.16	—7,602	9,500	—17,102	35,666
Pere Marquette	2,230	1,927,039	457,682	3,116,812	261,794	804,191	38,105	1,593,707	80,243	2,796,411	89.72	320,401	57,981	261,735	—16,883
Perkiomen	41	83,760	7,921	108,520	8,790	4,058	13	52,713	179	65,775	60.61	42,746	545	42,201	15,504
Philadelphia & Reading	1,127	5,505,035	822,811	6,931,822	593,499	2,033,288	37,319	3,567,541	152,628	6,404,329	92.39	527,493	66,014	461,008	513,725
Phila., Bethlehem & New England	71	.....	.....	83,197	7,204	12,623	406	74,626	1,301	96,161	115.58	—12,964	1,030	—13,994	—34,835
Pittsburgh & Lake Erie	224	2,266,041	230,169	2,784,241	489,369	928,673	20,734	1,022,557	53,668	2,516,885	90.39	267,356	75,000	192,144	—475,636
Pitts. & West Virginia	63	133,094	8,650	163,116	28,625	65,279	1,597	69,518	6,826	180,666	110.75	—17,550	10,782	—28,785	41,641
Pitts. & Shawmut	103	122,428	4,491	128,570	15,086	36,245	1,240	50,982	3,684	107,237	83.40	21,333	106	21,226	22,587
Pitts., Cinc., Chicago & St. Louis	2,383	5,307,205	1,823,600	10,580,512	950,508	2,897,812	113,508	4,448,229	197,937	8,691,075	82.14	1,889,437	301,063	1,588,208	1,570,438
Pitts., Shawmut & Northern	204	119,848	6,701	128,858	22,991	53,509	2,172	60,977	9,452	149,101	115.70	—20,243	1,903	—22,146	—842
Port Reading	21	141,414	.....	190,989	10,316	18,167	25	108,392	335	137,236	71.85	53,753	—1,249	55,003	39,924
Quincy, Omaha & Kansas City	255	60,504	24,028	123,105	17,178	31,103	118	72,558	1,458	122,423	99.44	682	3,647	—2,924	18,090
Richmond, Fredricksburg & Potomac	81	261,859	139,791	692,558	38,059	107,489	7,849	220,131	13,399	381,471	55.08	311,087	14,992	296,090	—82,997
Rutland	415	230,237	114,727	483,993	52,033	114,172	4,989	216,577	17,616	406,987	84.08	77,006	18,334	58,664	116,105
St. Joseph & Grand Island	258	199,042	40,109	291,407	53,172	46,898	2,434	130,151	12,630	245,287	84.17	46,119	10,907	35,177	46,788
St. Louis, Brownsville & Mexico	548	313,700	181,449	607,937	152,124	98,274	7,418	158,053	20,395	435,429	71.62	172,508	9,800	162,605	68,436
St. Louis Merchants Bridge Terminal	9	.....	662	333,848	39,062	77,461	830	254,142	5,737	377,232	112.99	—43,384	8,250	—51,634	—8,343
St. Louis-San Francisco	4,761	4,634,614	1,903,519	7,023,170	1,039,256	1,608,439	68,024	3,121,583	215,051	6,047,401	86.10	975,769	222,159	—751,763	408,630
St. Louis Transfer	6	.....	.....	146,069	10,239	26,705	203	85,365	2,185	124,698	85.36	21,371	110	21,261	490
St. Louis, San Francisco & Texas	134	106,041	17,750	134,476	37,723	23,672	2,015	78,541	6,003	147,953	110.02	—13,477	1,880	—15,362	—9,330
St. Louis Southwestern	939	1,235,580	164,462	1,569,740	200,471	268,222	23,355	487,498	37,239	1,021,416	65.07	548,324	42,984	505,265	362,026
St. Louis S. W. of Texas	807	474,713	137,670	762,378	205,009	222,945	9,666	492,284	23,342	953,240	125.03	—190,861	31,450	—222,521	—59,200
San Antonio & Aransas Pass	736	209,531	90,224	412,151	143,359	126,163	6,764	173,172	17,925	467,150	113.34	—54,999	15,000	—70,268	14,966
Seaboard Air Line	3,563	2,858,836	859,878	4,795,245	557,540	862,325	89,686	1,930,655	107,755	3,599,948	75.07	1,195,296	150,000	1,044,262	856,473
South Buffalo	11	26,667	.....	86,547	6,175	14,502	343	52,801	1,510	75,331	87.04	11,216	—3,667	7,549	—43,342
Southern	6,983	7,943,941	2,775,465	14,045,676	1,978,951	2,626,247	176,964	5,494,804	297,018	10,692,247	76.12	3,353,430	363,434	2,987,939	2,061,458
Southern Ry. in Mississippi	278	123,043	59,929	222,146	46,908	25,517	5,018	94,261	5,441	177,144	79.74	45,002	9,800	35,202	42,602
Southern Pacific	7,042	9,003,118	4,038,885	16,110,254	2,268,151	2,927,233	135,698	5,848,819	275,977	11,758,259	72.98	4,351,995	676,932	3,671,440	1,549,869
Spokane International	156	114,691	20,167	137,158	14,917	10,729	2,310	40,084	5,302	73,356	53.48	63,802	4,519	59,263	37,147
Spokane, Portland & Seattle	538	516,621	137,246	760,287	121,630	93,499	8,164	239,436	21,861	489,042	64.32	271,245	80,000	190,924	201,244
Staten Island Rapid Transit	23	88,920	66,559	168,175	19,320	27,548	1,141	102,717	8,787	159,513	94.84	8,662	15,000	—6,338	—29,570
Tennessee Central	292	196,370	45,287	288,760	49,383	56,430	4,729	118,056	6,808	235,405	81.52	53,355	5,687	47,666	63,106
Terminal R.R. Assn. of St. Louis	36	.....	3,372	364,507	47,445	75,208	1,156	178,247	4,560	311,280	85.39	53,227	27,139	26,087	94,344
Texas & Ft. Smith	87	109,142	21,684	157,772	20,081	19,717	867	49,734	2,517	92,613	58.70	65,159	15,780	49,378	51,899
Texas & New Orleans	469	545,211	160,309	837,320	131,138	213,451	5,745	266,733	16,987	673,568	80.44	163,751	21,129	140,632	175,088
Texas & Pacific	1,946	1,934,526	1,028,543	3,559,922	475,357	770,136	34,360	1,474,624	72,968	2,872,207	80.68	687,715	110,900	576,625	507,776
Toledo & Ohio Central	435	668,146	69,541	774,011	84,036	250,244	9,643	440,522	19,544	807,233	104.29	—33,222	38,136	—71,391	75,683
Toledo, Peoria & Western	247	121,618	48,932	180,591	17,288	47,149	2,192	91,699	5,445	163,774	90.68	16,817	8,500	8,317	—12,327
Toledo, St. Louis & Western	454	745,596	30,712	813,446	95,402	181,169	6,456	388,479	11,524	683,028	83.96	130,418	31,000	99,124	33,573
Trinity & Brazos Valley	368	137,751	21,717	174,013	59,416	53,187	2,278	92,395	7,203	214,480	123.25	—40,468	6,959	—47,521	—6,225
Ulster & Delaware	128	34,187	14,737	90,991	13,853	19,432	1,216	54,190	4,337	93,474	102.72	—2,484	5,000	—7,482	22,687
Union R.R. of Pennsylvania	40	.....	.....	587,658	42,129	211,522	219	404,929	6,732	665,531	113.25	—77,873	5,000	—82,873	—133,497
Union Pacific	3,614	7,192,044	1,547,833	11,726,008	1,114,988	1,923,708	42,845	3,280,673	253,697	6,842,126	58.35	4,883,882	285,000	4,598,080	2,009,554
Utah	98	168,314	592	169,314	12,627	29,437	232	36,201	2,275	80,773	47.71	88,541	4,022	84,519	53,699
Vicksburg, Shreveport & Pacific	171	234,293	98,839	390,283	36,696	73,929	6,847	179,595	10,590	311,797	79.88	78,486	12,417	66,015	42,014
Washington Southern	35	111,103	81,314	375,628	31,724	44,739	3,975	132,660	6,108	223,475	59.49	152,153	7,812	144,340	—95,937
Virginian	523	1,076,158	57,560	1,298,987	112,959	248,550	4,018	488,816	17,084	868,035	66.82	430,953	45,000	385,945	323,187
Wabash	2,503	3,306,046	801,624	5,113,915	563,500	1,196,797	52,893	2,410,120	129,978	4,376,519	85.58	737,396	112,970	623,552	562,694
West Jersey & Seashore	361	249,500	379,076	704,233	202,011	227,652	15,357	529,911	23,700	1,004,215	142.59	—299,982	48,992	—348,983	110,373
Western Maryland	689	1,179,097	75,833	1,417,549	187,475	452,836	19,413	558,021	43,395	1,272,204	89.72	145,345	43,200	102,145	291,696
Western Pacific	1,041	1,110,394	131,316	1,346,473	186,249	189,369	21,328	421,658	28,620	866,659	64.37	479,814	67,602	412,130	302,359
Western Ry. of Alabama	133	132,566	74,742	263,690	28,912	40,054	5,345	85,618	6,557	170,435	64.63	93,256	6,125	87,124	59,424
Wheeling & Lake Erie	511	886,519	58,646	1,034,542	107,835	316,042	5,565	537,046	25,890	995,368	96.21	39,173	62,000	—22,828	147,275
Wichita Falls & Northwestern	328	116,827	57,126	201,076	58,295	35,522	1,979	153,921	5,298	255,007	126.82	—53,930	11,178	—65,246	—53,988
Wichita Valley	256	106,422	50,958	182,571	23,364	10,402	274	77,845	3,451	115,335	63.17	67,236	5,064	62,169	79,878
Yazoo & Mississippi Valley	1,381	1,726,649	542,196	2,604,770	421,899	572,093	15,201	936,472	53,081	2,004,490	76.95	600,279	70,833	526,707	302,884

Western Railway Club

At the April 19, 1920, meeting of the Western Railway Club a paper will be presented by S. W. Mullinix, superintendent of shops of the Chicago, Rock Island & Pacific on Modern Methods of Reducing Cost of Locomotive Repairs.

Pacific Fruit Express to Spend $2,000,000

To cope with the increased output of California products, the Pacific Fruit Express plans to spend $2,000,000 this year in enlarging its icing facilities. C. M. Secrist, vice-president and general manager, stated that the Pacific Fruit Express used approximately 1,000,000 tons of ice in 1919, manufacturing 231,000 tons, harvesting 175,000 tons and contracting for the balance. The ice was almost all used to protect shipments moving over the Southern Pacific and the Union Pacific, the joint owners of the Pacific Fruit Express. The contemplated improvements will include:

The conversion of the plants to electric drive and the installation of additional electrically-driven units at Roseville, Cal., Colton and Los Angeles; the extension of icing platforms, the increasing of day storage facilities, the construction of new icing plants at Roseville, Colton and Los Angeles, Cal., and North Platte, Neb., Wallula, Wash., Carlin, Nev., and Laramie, Wyo., and the abandonment of the icing station at Truckee Nev., and the establishment of a regular icing station at Sparks, Nev., for all shipments moving over the Southern Pacific under refrigeration.

Wage Conferences Resumed

Conferences between the committee of 15 representing the railroad managements and the 17 representatives of the railroad labor organizations that are asking for general increases in wages were resumed at Washington on March 22, and E. T. Whiter, of the Pennsylvania, was elected as chairman of the conference. The conference began its work by discussing the extent to which it should use the data collected by the Railroad Administration in connection with the hearings held during the summer and fall of 1919 by the Board of Railroad Wages and Working Conditions and in negotiations since that time with the director general. An estimate of the amount of the demands of the various classes of employees made by application of the terms of their proposed schedules to the 1919 payroll shows a total proposed increase of $1,100,000,000, as follows:

	Present Payroll.	New Payroll.
Train crews	$708,000,000	$998,000,000
Shopmen	730,000,000	914,000,000
Maintenance of way	577,000,000	978,000,000
Telegraphers	115,000,000	165,000,000
Clerks	415,000,000	590,000,000
All others	225,000,000	225,000,000
Total	$2,770,000,000	$3,870,000,000

The increases granted to the principal classes of employees by the Railroad Administration during 1917 and 1920 were approximately as follows:

(The last three ciphers are omitted.)

	Payroll		
	1917.	1920.	Increase.
Train crews	$508,000	$708,000	$200,000
Shopmen	378,000	730,000	352,000
Maintenance of way	349,000	577,000	228,000
Telegraphers	73,000	115,000	42,000
Clerks	259,000	415,000	156,000
All others	173,000	225,000	52,000
Total	$1,740,000	$2,770,000	$1,030,000

Nominations for members of the permanent Railroad Labor Board have been submitted to the President by both the employees and the railroads.

THERE WILL BE MUCH URGENT DEMAND for service; much hue and cry for improvement and much fault-finding—and the Plumb planning brotherhood propagandists are waiting all these as ammunition. What the railroads under private ownership get as a heritage in the way of undone work, impoverished treasuries and equipment, unsolved wage problems and all and sundry difficulties come from government control. Let this be remembered when the struggle of the roads to regain normal efficiency begins.—*Rochester (N. Y.) Democrat-Chronicle.*

Traffic News

The Farmers' National Grain Dealers' Association, at a meeting held at Chicago on March 17, instituted a movement to establish a national railroad claim department within the association to collect losses and damages incurred in transit of grain and live stock of the affiliated companies.

Cotton brought to Boston by water, largely from Egypt, and now held there because of congestion on New England railroads is said to amount to 100,000 bales; some of it piled on piers and some still lying in vessels because no place can be found to unload. Steamships have had to go from one pier to another to discharge their loads in small lots.

C. A. Butler, formerly assistant to the vice-president of the Chicago, Milwaukee & St. Paul, has been appointed eastern traffic manager of the Anaconda Copper Mining Company, 42 Broadway, New York City. During the period of federal control, Mr. Butler was assistant to J. G. Woodworth, in charge of traffic in the Northwestern Region. His railroad career covers seventeen years, all of which was spent in traffic work, principally with the St. Paul.

The embargo on express shipments caused by the strike of clerks and freight handlers employed by the American Railway Express Company was lifted in 14 states and the District of Columbia recently, according to officers of the company at Chicago. The states affected are North Dakota, Nevada, Utah, Arizona, New Mexico, Arkansas, Louisiana, Georgia, Delaware, Maryland, North Carolina, South Carolina, California and Florida.

The Board of Railway Commissioners for Canada recently refused the application of the Canadian Manufacturers' Association for the issuance of an order directing the extension of the Canadian Car Service Rules so as to provide for what is known as the "average demurrage plan" which now forms a part of the National Car Demurrage Rules in force in the United States with the approval of the Interstate Commerce Commission. The application set out that the demurrage on all cars held for loading or unloading shall be computed on the basis of the average time of detention to all cars released each calendar month. The method of computation outlined is that a credit of one day shall be allowed for each car released within the first 24 hours of free time, while a debit of one day shall be charged for each 24 hours or fraction thereof that a car is detained beyond the first 48 hours of free time. Not more than one day's credit is to be allowed on any one car and in no case is more than five days' credit to be applied in cancellation of debits accrued on any one car, thus making a maximum of seven days, including Sundays and holidays, that any car may be held free. At the end of the calendar month the total number of days credited will be deducted from the total number of days debited and the demurrage charge per day charged on the remainder. If the credits equal or exceed the debits no charge is to be made for the detention of the car and no payment is to be made to the consignor or consignee in respect of such excess of credit. Before the decision was made by the board extensive hearings were held on the principles involved in the proposed changes.

Spring Meeting of the N. I. T. League

The annual spring convention of the National Industrial Traffic League was held at St. Louis, Mo., on March 18 and 19. Soon after convening the League discussed several important matters arising under the new railroad legislation and adopted the following resolution, offered by the executive committee with respect to the hearing to be held by the Interstate Commerce Commission in Washington on March 22, to obtain views as to how it should proceed to adjust rates under Section 422 of the Transportation act:

"The executive committee recommends that at the hear-

ing in Washington, March 22, the League make the following recommendations to the Commission:

"1. That, for the purposes of this section, the rate adjustment be made for the carriers territorially, and not for the carriers as a whole.

"2. That, as a tentative plan, the division be made into three territories corresponding, approximately, with the three classification territories (Official, Southern and Western).

"3. That, if its investigation under section 19-A of the act enables it to determine definitely the value of the railway property of any of any carrier or carriers, such value might properly be used.

"Where such value is not available, we suggest the use of the property investment accounts of the carriers, subject to such modifications as the Commission deems justified, based on data available to it, and with the further provision that from such property investment accounts there shall be eliminated all items not representing investment in the railway property held for and used in the service of transportation."

The serious car shortage which exists throughout the United States and the report that large industries in many communities have been compelled to close down repeatedly for lengthy periods for want of cars, led the League to adopt resolutions demanding an immediate allocation of freight cars, so that there may be full utilization of the cars available. The resolution adopted called for the appointment of a special committee by the Industrial Traffic League to discuss with the American Railroad Association or the Car Service Commission, and, if necessary, with the Interstate Commerce Commission, the necessity of the immediate redistribution of freight cars. This committee will be appointed by W. H. Chandler, president of the League.

The League also adopted a resolution calling upon the Interstate Commerce Commission to speedily decide cases left over from the United States Railroad Administration, in which shippers were applying for reduction in rates, when such cases had been wholly or partially completed.

The disparity in rates of exchange between the United States and Canada, which has resulted, members of the League said, in a request from railroads for the prepayment of freight charges upon commodities shipped into Canada, led to the adoption of a resolution not to prepay freight charges upon Canadian shipments in the absence of any tariff regulation requiring such prepayment.

A committee headed by President W. H. Chandler, and composed of the officers of the League and the members of the executive committee, was appointed to represent the League before the Interstate Commerce Commission when it takes up for consideration the application of the American Express Railway Company for the approval of the wartime consolidation of the big express companies.

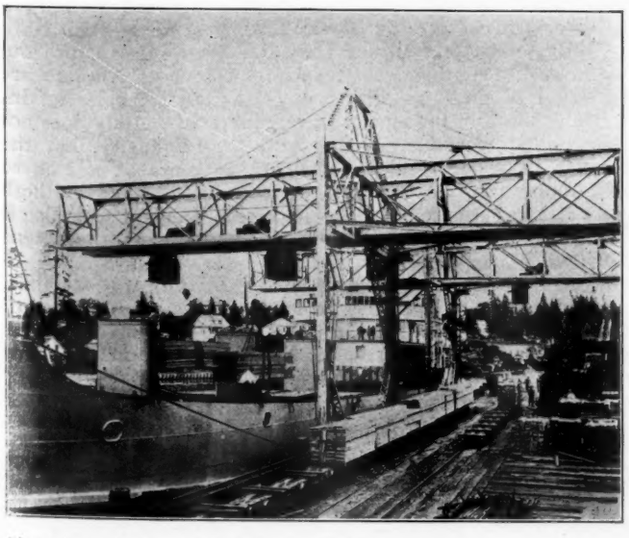


Photo from Underwood & Underwood, N. Y.

An Interesting Method of Loading Lumber—Portland, Oregon

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has announced a proceeding of investigation as to the propriety and reasonableness of the increases in express rates proposed by the American Railway Express Company.

The Commission has announced a hearing at Washington on March 29 on protests against the proposed increase in fares on the Hudson & Manhattan between New Jersey and New York, which it has been asked to suspend.

The commission has issued an order taking note of the fact that the President has designated Walker D. Hines, director general of railroads, as the agent provided for in the transportation act to be sued on behalf of the government for causes of action arising out of federal control and that Mr. Hines has consented to and requested the substitution of himself as such agent for himself as director general of railroads in reparation claims pending at the termination of federal control. The order provides for this substitution.

The Interstate Commerce Commission has issued a notice to carriers that the jurisdiction over intrastate rates, etc., passed to the state regulating authorities on March 1 with the limitation provided in the transportation act that they shall not be reduced prior to September 1 without approval of the Interstate Commerce Commission. It is stated that requests for approval of reductions in intrastate rates should be made by application to the commission, preferably through the state commissions, and that the state commission, in transmitting such application to the federal commission should express its approval or disapproval and furnish any information in its possession which it is believed might be helpful to the commission.

The new transportation act authorizes the Interstate Commerce Commission to prescribe the classes of property for which depreciation charges may properly be included under operating expenses. The commission has issued a circular stating that information received by it indicates doubt as to the propriety of carriers making any charges to operating expenses with respect to depreciation prior to such time as the commission shall prescribe the specific percentages of depreciation which shall be charged. Until the commission shall otherwise order, it says, all carriers subject to the act should continue to observe the requirements respecting the accounting for depreciation which are embodied in the effective accounting classifications.

20 Per Cent Increase in Pullman Rates Asked

The Interstate Commerce Commission has given permission to the Pullman Company to file tariffs providing for a 20 per cent increase in Pullman rates in a simple form and without the necessity of completely revising the tariffs. The application for the permission was made in a letter addressed to the commission on March 5 by J. S. Runnells, president of the Pullman Company. Pullman rates have not been increased during the period that railroad and express rates and wages and prices generally have been increasing, but were reduced by the commission eight or ten years ago.

Increased Grain Minimums Continued

The Commission has issued a special permission to the carriers, authorizing them to publish and file on one day's notice special supplements to their tariffs postponing from March 31 to August 31, the expiration date on minimum weights on grain and grain products. These increases in carload minimums were made by the Railroad Administration when the railroads were having great difficulty in furnishing an adequate supply of cars; and the commission finds that the emergency that justified the establishment of the increases still exists.

Foreign Railway News

Canada exported to Trinidad during January locomotives to the value of $89,000 and to the Argentine $255,000.

Paulista Railway of Brazil to Electrify

The Paulista Railway authorities have announced their purpose to proceed in the near future with the electrification of its line from Jundiahy to Campinas (about 25 miles), and eventually to San Carlos. This railway is a prosperous property owned by Brazilian capital. It is in the coffee growing district of Brazil and has been considering electrification for some time as a means of overcoming, by the use of hydro-electric power, the high cost and difficulty of securing coal.

Vanadium Corporation to Build Railroad in Peru

J. Leonard Replogle, president of the Vanadium Corporation of New York, on March 18, following a meting of the board of directors, made the following announcement:

"We have placed a contract with the Foundation Company for a railroad from the mines in Peru to Lake Pun Run, covering 12 miles of the most difficult section of our transportation. The railroad should be completed about July 1, after which we expect to double or triple our output. We have a large stock of ore mined and ready for shipment."

Colonel M. G. Baker, vice-president of the company, will sail for Peru in April to superintend the construction of the railroad.

England's Exports of Railway Material

According to the Board of Trade returns, the exports of railway material during January, 1920, were as follows, the corresponding figures for January, 1919, being also stated:

	January, 1920	January, 1919
Locomotives	£426,147	£48,601
Rails	106,953	52,906
Carriages	156,372	13,268
Wagons	540,267	43,167
Tires and axles	122,333	69,569
Wheels and axles	167,447	22,210
Chairs and metal sleepers	15,944	5,513
Miscellaneous permanent way	185,702	51,899
Total permanent way	600,939	115,394

The total weight of rails exported was 6,707 tons for January, 1920, as against 2,858 tons for January, 1919, and of chairs and metal sleepers 778 tons for January, 1920, as against 355 tons for January, 1919.

Construction Work on Swedish State Railways

The State Railways of Sweden showed a profit in September, 1919, of approximately $675,000 (taking the value of the crown at its normal value of $0.268), according to figures sent by Vice-Consul Orsen N. Nielsen, Stockholm. The earnings in October had risen to $1,050,000, thus seeming to indicate that the high freight and passenger rates will not be further increased. Press reports frequently demand lower rates, principally from the owners of mines and of timberlands.

The State Railways' Administration has asked the government for $11,500,000 for construction work and for new buildings in 1920. Included in the work contemplated by the administration are: Electrification of the railway from Kiruna to Svarton at a total cost of $5,550,000; relaying of the line Kallered-Lindome, and construction of houses for employees. For the latter purpose $1,050,000 are requested; $3,000,000 is requested for the purchase of land and $3,500,000 for the purchase of rolling stock. Further, the administration expects to expend $650,000 in equipping cars with airbrakes.

For the construction of new lines in 1920 and to enable work to be started on a new bridge over the Ume river, the directors of the Inland Railway have asked the government for $2,180,000; $430,000 to be used in 1920 and $1,750,000 to be available in 1921.

England's Railway Deficit

The Ministry of Transport has issued a return showing the financial results of the working of controlled railways for December, 1919, and on the month's operations there was a deficit of £3,511,412, or approximately $14,045,648. In respect of the government guarantee there is a liability for the month of £3,988,000, representing standard year proportion of net receipts, plus £87,200 for interest on capital works brought into use, making a total of £4,075,200. The net government liability for the month is therefore £7,839,153. For the nine months to December 31, 1919, there was an excess of revenue over expenditures of £7,152,018. The government guarantee in respect of standard year proportion of net receipts including £786,600 interest on capital works, was £36,165,600, leaving a net government liability for the nine months ended December 31, 1919, of £31,013,582.

Persian Railway to the Caspian Sea

Consul General Robert F. Skinner has written to Commerce Reports from London, under date of February 20, giving the following details as given to the British foreign office concerning the construction of a railway across Persia from Mesopotamia to the Caspian Sea:

"On January 10, the Persian government granted to the Persian Railway Syndicate (Ltd.), an option for the construction and equipment of a railway from Khanikin to Teheran via Kermanshah and Hamadan, with a branch to Enzeli on the Caspian Sea. The Persian government has reserved the right to decide later whether the railway is to be constructed as a Persian State line or whether a concession shall be granted to the syndicate to build the line with a Persian government guaranty on such terms as may be necessary and practicable. If the railway is built as a Persian state line, the capital necessary for the undertaking would be raised by the issue of Persian government bonds secured by the necessary guaranties."

Italy Looking to Germany for Locomotives

Italy, which during the past two or three years has placed large orders for locomotives in the United States, is now looking to Germany as a source of supply. The reason for this, as explained in Commerce Reports in a communication from Alfred P. Dennis, commercial attaché at Rome, is the low purchasing power of the Italian lira in the American market. "It is a question," says Mr. Dennis, "how soon Germany will be able to satisfy any foreign demands of this sort, however. At the conclusion of the war that country possessed between 12,000 and 13,000 locomotives, 4,000 of which the allies took under the terms of the peace settlement; so that today Germany stands in more acute need of locomotives than does Italy.

"With adequate facilities Italy has been able to turn out high-class locomotives, and such concerns as Ansaldo are engaging in their manufacture. But Italy occupies an inferior position in the matter of raw materials. Italy does not lack skilled workmen in this branch of industry, but the present labor situation is decidedly unfavorable, and these two hindrances of labor difficulty and the shortage and high cost of steel, which must be imported, combine to make it impossible for Italy to produce locomotives as cheaply as they can be supplied from abroad.

"The situation, therefore, is such that Italy, for the time, must continue to purchase from foreign sources, and until Germany is prepared to supply the demand the United States must be relied upon, in spite of unfavorable exchange, for whatever locomotives are imperatively needed."

A LITTLE MORE STUDY of the transportation question is enough to convince the man with a practical mind that poorly equipped railroads, unable to handle promptly and satisfactorily the traffic of the country, add more to the cost of doing business and cause more loss to shippers and producers than would equal the cost of permitting the roads to earn enough money to finance their improvement.—*St. Louis (Mo.) Globe-Democrat.*

Equipment and Supplies

87 Russian Locomotives Taken

The following railroads have ordered a total of 87 of the total of 200 Decapod locomotives originally built for the Russian government, which the War Department has been trying to sell: Western Maryland, 10; Detroit, Toledo & Ironton, 15; St. Louis-San Francisco, 10; Atlantic Coast Line, 10; Charleston & Western Carolina, 3; Norfolk Southern, 4; John Ringling, 5; Seaboard Air Line, 20; St. Louis, Brownsville & Mexico, 5, and Nashville, Chattanooga & St. Louis, 5. The remainder of the locomotives, together with a considerable amount of car equipment, have been advertised for sale by the War Department and bids are to be received by April 5.

Locomotives

THE BOSTON & MAINE is in the market for 40, six-wheel switching locomotives and 10 Pacific type locomotives.

THE INDUSTRIAL MATERIALS COMPANY, INC., 50 Pine street, New York, is inquiring for 10 each, of three types of Mallet locomotives, for export to Norway.

THE BATURITE RAILWAY (Brazil), has ordered 1 consolidation and 2 ten-wheel locomotives, of meter gage, from the American Locomotive Company.

THE KENTUCKY & INDIANA TERMINAL RAILROAD has ordered 3, eight-wheel superheater switching locomotives, for April delivery, from the Baldwin Locomotive Works.

THE BRAZILIAN GOVERNMENT is negotiating with the American Locomotive Company for 6 ten-wheel, 10 Consolidation and 18 other locomotives of meter gage, and for 6 ten-wheel locomotives of broad gage.

THE KOPPERS COMPANY, Pittsburgh, Pa., has ordered 2, 0-4-0 type locomotives from the American Locomotive Company. These locomotives will have 16 by 24 in. cylinders and a total weight in working order of 99,000 lb.

THE DONNER STEEL COMPANY, Buffalo, N. Y., has ordered one 0-6-0 type locomotive from the American Locomotive Company. This locomotive will have 21 by 26 in. cylinders and a total weight in working order of 144,000 lb.

THE PITTSBURGH LIMESTONE COMPANY, New Castle, Pa., has ordered one, 0-4-0 type locomotive from the American Locomotive Company. This locomotive will have 10 by 16 in. cylinders and a total weight in working order of 39,000 lb.

THE ATLANTIC COAST LINE, reported in the *Railway Age* of March 19, is inquiring for 25 Pacific type locomotives, has ordered this equipment from the American Locomotive Company. These locomotives will have 25 by 28 in. cylinders and a total weight in working order of 277,000 lb.

THE MAINE CENTRAL has ordered 4, 4-6-0 and 4, 0-6-0 type locomotives from the American Locomotive Company. The 4-6-0 type locomotives will have 22 by 28 in. cylinders, and a total weight in working order of 206,000 lb., and the 0-6-0 locomotives will have 21 by 28 in. cylinders and a total weight in working order of 166,000 lb.

Freight Cars

THE DONNER STEEL COMPANY, Buffalo, N. Y., is inquiring for from 500 to 750, 70-ton hopper cars.

THE CHILE EXPLORATION COMPANY, New York, is inquiring for 25 ore cars of 70 tons capacity.

THE CENTRAL MACAGUAY (Cuba) has ordered 10 cane cars, of 25 tons capacity, from the Magor Car Company.

THE CENTRAL CAMAGUEY (Cuba) has ordered 15 cane cars, of 25 tons capacity, from the Magor Car Company.

THE CENTRAL SAUTE MARIA (Cuba) has ordered 50 cane cars, of 25 tons capacity, from the Magor Car Company.

THE NEW YORK CENTRAL is inquiring for 1,800 40-ton stock cars and for 3,000 40-ton double sheathed box cars.

THE MERCHANTS DESPATCH TRANSPORTATION COMPANY, is building 250 refrigerator cars at its East Rochester, N. Y., plant.

THE CHICAGO, BURLINGTON & QUINCY is inquiring for 500 box cars, of 40 tons capacity and 500 stock cars, of 30 tons capacity.

THE ATCHISON, TOPEKA & SANTA FE has ordered 500 gondola and 1,500 refrigerator cars from the American Car & Foundry Company.

THE VERDI LUMBER COMPANY, Reno, Nev., is inquiring for ten 34-ft. to 36-ft. 50,000-lb. to 60,000-lb. capacity flat cars for logging service.

THE VIRGINIAN, reported in the *Railway Age* of February 6 as having renewed its inquiries for 1,000 steel coal cars, has ordered this equipment from the Pressed Steel Car Company. These cars are to have a capacity of 120 tons each.

Passenger Cars

THE ILLINOIS CENTRAL is inquiring for 9 coaches.

THE LOUISVILLE & NASHVILLE is inquiring for 5 coaches.

THE CHICAGO, BURLINGTON & QUINCY is inquiring for 25 coaches.

THE WESTERN OF ALABAMA is inquiring for 10 steel coaches and two steel baggage cars.

THE ILLINOIS CENTRAL is preparing specifications for 30 all-steel suburban coaches for its new electrified suburban service.

THE UNION PACIFIC, reported in the *Railway Age* of March 5, as being in the market for 65 chair and baggage cars, has ordered 40, 70-ft. steel chair cars and 25, 60-ft. baggage cars from the Pullman Company. These cars will be equipped with six-wheel trucks and clasp brakes.

Iron and Steel

THE INDUSTRIAL MATERIALS COMPANY, INC., 50 Pine street, New York, is inquiring for 400 gross tons of 50 lb. rail and accessories.

THE NETHERLANDS GOVERNMENT has ordered from the United States Steel Corporation, 2,700 tons of steel beams and 692 tons of steel channels, for use in the Dutch East Indies.

Machinery and Tools

THE INGERSOLL-RAND COMPANY, New York, recently sold 252 of its Little David pneumatic drills and hammers to the Chickasaw Ship Building & Car Company, Birmingham, Ala., for use at its new plant at Chickasaw.

Signaling

THE BOSTON & ALBANY has ordered from the General Railway Signal Company a mechanical interlocking, 36 levers, for Webster Junction, Mass.; and also 19 electric locks, Model 2, form B.

THE BALTIMORE & OHIO has ordered from the General Railway Signal Company an electric interlocking machine, Model 2, with 29 working levers, to be installed by the railroad company's forces at Ohio Junction, Ohio.

THE BOSTON ELEVATED is preparing to reconstruct the signaling on that section of its rapid transit lines in the Washington street tunnel, involving 1.14 miles of double track in the tunnel in addition to the north and south approaches thereto. A total of 33 blocks will be equipped with three-position color-light signals and automatic stops, all operating on alternating current with the exception of the automatic stops, which will be of the pneumatic type controlled by a. c. valves. All apparatus is being furnished by the Union Switch & Signal Company, Swissvale, Pa., and the work will be done by railroad forces.

Supply Trade News

The Chambers Valve Company, New York, has removed its office from 30 Church street to room 1017, 23 West Forty-third street.

J. F. Griffin has been appointed chief draftsman of the **Locomotive Feed Water Heater Company,** 30 Church street, New York.

Western, Manning, Maxwell & Moore, Inc., on March 16, moved into its new store at 40-42 Fremont street, San Francisco, Cal. This is a subsidiary company of **Manning, Maxwell & Moore, Inc.,** New York.

George H. Snyder, chief clerk in the store department of the Minneapolis, St. Paul & Sault Ste. Marie at St. Paul, Minn., has been appointed sales engineer of the **American Steel Foundries,** with headquarters at St. Paul.

The Morse Chain Company, Ithaca, N. Y., has opened two additional branch offices, one at 1402 Lexington building, Baltimore, Md., in charge of **E. R. Morse,** and the other at 302 Harrison building, Philadelphia, Pa., with **M. H. Rodda** as manager.

The Curtain Supply Company, Chicago, has taken over the manufacture and sale of the steam and electric railway devices formerly made and sold by the Forsyth Brothers Company, Harvey, Ill., and is increasing the capacity of its plant to care for the additional business.

Leslie R. Pyle, whose election to the vice-presidency of the **Locomotive Firebox Company,** with headquarters at Chicago, was announced in the *Railway Age* of March 19, page 986, was born at Cleveland, Ohio, on June 7, 1880. He entered railway service on February 6, 1906, as a locomotive fireman on the Minneapolis, St. Paul & Sault Ste. Marie. On June 1, 1909, he became an engineman, and from 1912 to 1913 was traveling fireman. On May 1, 1913, he was appointed a fuel supervisor, which position he retained until July 1, 1918, when he was appointed supervisor of the Fuel Conservation Section of the Division of Operation of the United States Railroad Administration. This position he retained until March 1, 1920, when he was elected to the vice-presidency of the Locomotive Firebox Company.

L. R. Pyle

The Barrett Company, 17 Battery place, New York, is having plans made for putting up a 16-story office building at Rector and West streets. Warren & Wetmore, New York, are the architects. The general contract has been let to the George A. Fuller Company, New York.

The **Koppel Car Repair Company** has been organized recently as a subsidiary of the **Koppel Industrial Car & Equipment Company,** Koppel, Pa. The new company has a shop located on the property of the parent organization and is turning out four repaired cars a day and has capacity for the dismantling and preparing for repair of about 30 cars at one time.

C. H. Martin and **Gustav Schirmer,** of the **Whiting Foundry Equipment Company,** Harvey, Ill., after serving for several years in its estimating and sales department at the main office, have been respectively transferred to its Pittsburgh and Detroit offices, to take up the duties of sales engineers. Both men are experienced engineers and are thoroughly familiar with the design and construction of cranes and foundry equipment.

The George Cutter Company, South Bend, Ind., announces the acquisition by the Westinghouse Electric & Manufacturing Company of a financial interest in the company. The management and the commercial policies will remain unchanged, but advantage will be taken of the Westinghouse engineering and other facilities to expand the Cutter Company's activities. The Westinghouse Company will operate as sole distributors for the Cutter company's products.

Edward Wray has associated himself with **Railway Materials** as managing editor, with headquarters in Chicago. Mr. Wray was formerly managing editor and publisher of the Railway Electrical Engineer from its first issue in 1909 to 1916, when the magazine was purchased by the Simmons-Boardman Publishing Company, publishers of the *Railway Age*. Following the sale of the Railway Electrical Engineer, Mr. Wray continued his connection with the magazine as business manager, and later became associated with the Sangamo Electric Company, Springfield, Ill., as assistant general manager. In this capacity he had charge of the production, costs and stores departments of the company and the advertising and welfare departments. Mr. Wray received his education at the University of Wisconsin, graduating in 1905. He received the degree of electrical engineer in 1906, following a year of special work devoted exclusively to the investigation of all of the various systems of lighting steam railroad cars by electricity. In carrying out this work Mr. Wray had the assistance of 10 electrical students of the senior class at the university. Mr. Wray is a member of the American Institute of Electrical Engineers, associated member of the Railway Storekeepers' Association and the Association of Railway Electrical Engineers, and has been treasurer of the Railway Electrical Supply Manufacturers' Association since its organization in 1909. Railway Materials, the paper of which Mr. Wray is now managing editor, was until recently known as the Railway Storekeeper. It is published by the former Railway Storekeepers' Association, now known as Section VI Purchases and Stores, of the American Railroad Association.

E. Wray

The Metal & Thermit Corporation, New York, in order to take care of its increasing business in the New England states and in Canada, has appointed **James G. McCarty** manager of its Canadian branch, with headquarters at Toronto, Ont., and has transferred **Robert L. Browne** from its New York office to Boston, Mass., where he will have charge of all sales in the New England states. Mr. McCarty was graduated from Stevens Institute of Technology in 1906, and became affiliated with the Metal & Thermit Corporation in 1909. He has had a wide and varied experience with all phases of the Thermit process and has represented the company in many sections of the United States and Canada. Mr. Browne has been associated with the New York office since 1917.

G. E. Warren has resigned as assistant manager of the service bureau of the Universal Portland Cement Company, Chicago, effective April 1, to continue his duties as manager of the **American Concrete Pipe Association.** Mr. Warren has been with the service bureau of the Universal Company

for five years during the last year of which he has also acted as secretary-treasurer of the American Concrete Pipe Association. This association has recently been reorganized and will open an office in Chicago with sufficient help to carry on its broadened activities. **J. W. Lowell,** eastern manager of the service bureau of the Universal Portland Cement Company, beginning April 1, will assume the duties of assistant manager of the same department at its headquarters at Chicago.

Walter H. Lovekin, for the past two years assistant to the president of the **Locomotive Feed Water Heater Company,** New York, has been elected vice-president and treasurer.

W. A. Lovekin

He was born in Philadelphia, Pa., and received his education at the Haverford Preparatory School, Haverford, Pa., and Princeton University. After leaving Princeton he entered the service of the Logan Trust Company, Philadelphia, Pa., where he spent some time in each of its various departments. He then went to the Bell Telephone Company of Pennsylvania, as a traffic inspector, first with headquarters in Philadelphia and later at Camden, N. J., in charge of the South Jersey territory. He subsequently joined the Philadelphia Bureau of Municipal Research as a member of the staff, and served in this capacity for two and a half years. During this time he made detailed studies and surveys of various civic problems, especially those problems coming under the headings of public safety and municipal purchasing and the budget. After leaving municipal research work he went with the R. J. Crozier Company, Philadelphia, as a salesman, handling railway, mill and mine supplies. On June 1, 1916, when the Locomotive Feed Water Heater Company was but two and a half months old, he entered its service, a few months later being appointed assistant to the vice-president, and in December, 1917, he was appointed assistant to the president, which position he held until his recent election as vice-president and treasurer. For the past two and a half years Mr. Lovekin, in addition to his other duties, has been in charge of the company's activities in the marine field. This involved the manufacture and delivery of feed water heaters, evaporators, boiler feed pumps, distillers and oil coolers for more than 550 ships built or building for the U. S. Shipping Board, Emergency Fleet Corporation. As vice-president he will continue in charge of the marine department and will be in charge of all sales and sales matters for the company, in addition to his duties as treasurer.

W. G. Walsh, notice of whose election as vice-president of the **Galena Signal Oil Company,** Franklin, Pa., with headquarters at Chicago, was announced in the *Railway Age* of March 5 (page 731), began railway service as an apprentice in the machine shops of the old Cleveland, Cincinnati, Chicago & Indianapolis, at Cleveland, Ohio. On the completion of his apprenticeship, he became a machinist on the Cincinnati, New Orleans & Texas Pacific at Somerset, Ky., and prior to 1890 was successively locomotive fireman, engineman and general mechanical instructor. In 1890 he was promoted to master mechanic of the Louisville division, with headquarters at Louisville, Ky., which position he retained until 1900, when he resigned to become mechanical expert for the Galena Signal Oil Company. In 1910 he was promoted to resident manager, with headquarters at Chicago, which position he retained until his recent election to the vice-presidency.

The American Steam Conveyor Corporation, Chicago, announces the appointment of the **Kon-Wald Engineering Company,** Mutual Life building, Buffalo, N. Y., as its representative in Buffalo and western New York. **F. A. Konzelman** is manager of that company. **The Brooks-Fisher Company,** Chandler building, Atlanta, Ga., has been appointed southeastern representative. This company was organized early last summer to carry on a business of manufacturers, agents and contractors. **J. M. Fisher** was for 15 years in the erection department of the Babcock & Wilcox Company, the last six years as district superintendent for the Atlanta territory, and **E. A. Brooks,** the other member of the firm, was, up to the time of the organization of the firm, assistant sales manager for the Atlanta office of the Babcock & Wilcox Company.

George E. Rex, manager of treating plants of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., has resigned, effective on April 1, to become vice-president of the **National Lumber & Creosoting Company,** Texarkana, Tex., with headquarters at Kansas City, Mo. Mr. Rex was born at Kahoka, Mo., on September 6, 1876. He graduated from Iowa Wesleyan College, Mt. Pleasant, Ia., in 1898, and entered railway service in the same year as a chainman on the Atchison, Topeka & Santa Fe. The following two years he was successively rodman and office engineer, and in 1900 was appointed transitman, retaining this position until 1901, when he was promoted to building supervisor at Topeka. From January, 1901, to May, 1903, he was division engineer of the Kansas City division, with headquarters at Kansas City, Mo., and, from the latter date until 1906, was an engineer of construction, with office at Chicago. On January 1, 1906, he was appointed assistant manager of the tie and timber department, with office at Topeka. In 1909, he was promoted to manager of treating plants, which position he retained until his recent election as vice-president of the National Lumber & Creosoting Company.

G. E. Rex

Lackawanna Steel Company

The gross sales and earnings of the Lackawanna Steel Co. for its fiscal year ended December 31, 1919, were $34,967,802. Manufacturing and producing costs and operating expenses totaled $30,422,284, leaving $4,545,518, to which was added dividends on investments, etc., amounting to $1,005,973, or a total of $5,551,491. The net earnings for the year after the deduction of administrative, selling and general expenses, ordinary taxes, commercial interest and discount totaled $3,060,663. From this deductions of interest on bonds, appropriations for depreciation, etc, were made of $2,703,800, leaving a profit for the year of $356,863. The company did not work at all to capacity during the year, its total shipments of 603,876 tons being half those of 1918, 1917 and 1916, and only two-thirds of those for 1915.

Western Electric Company

The annual report of the **Western Electric Company,** New York City, for the year ended December 31, 1919, shows net profits, after all charges and federal taxes, of $4,388,909, equivalent, after preferred dividends, to $17.25 a share on the 150,000 shares of common stock of no par value. Dividends of $10 a share were paid on the common stock, and the balance for that stock was $1,088,909. Due to the cessation of the war, sales to the government in 1919 were about $16,000,000 less than in 1918,

but the increase in other balances largely offset this loss, the report states, and total sales for 1919 were but $9,500,000 less than in 1918. The income account is as follows:

Sales	$135,732,489
Other Income	854,570
Less—	
Cost of Merchandise	118,420,440
Expenses	10,986,139
Taxes	1,578,399
Interest	1,263,180
Dividends	3,300,000
Balance for Common Stock	$1,088,909

General Electric Company Leases Remington Plant at Bridgeport, Conn.

On March 17, 1920, the General Electric Company leased, with option to purchase, the 40-acre war plant of the Remington Arms Company at Bridgeport, Conn. The contract involves about $7,000,000.

The plant was built in 1915-16, and is of the latest type of construction, being located in the industrial center of Bridgeport, in what is known as the East Side. The space covered by the buildings is about 9,000,000 sq. ft., and the floor area in them is 1,555,257 sq. ft., or over 36 acres.

The buildings are divided into four groups consisting of 13 five-story buildings and the drying kiln, five one-story buildings, guards' quarters, and two storage buildings. The buildings are all on the same level, and connected on each story with a corridor which runs through all of the 13 main buildings, much facilitating the delivery and movement of material.

The plant is expected to be in full operation by April 15, when the General Electric Company will employ many thousand people, all of whom can be easily housed, as the facilities already exist. It is not yet known just what products will be manufactured in the new plant.

Westinghouse, Church, Kerr & Co., Merged with Dwight P. Robinson & Co., Inc.

A plan for the merger of Westinghouse, Church, Kerr & Co., Inc., and Dwight P. Robinson & Co., recently submitted for the approval of stockholders, has been declared operative by the committee appointed to work out the plan.

Dwight P. Robinson has been elected president of Westinghouse, Church, Kerr & Co., pending final completion of the merger and organization of the new company. General Guy E. Tripp, now chairman of the board, remains chairman pending completion of the merger.

The idea which it is sought to work out has been explained by a circular issued to stockholders of Westinghouse, Church, Kerr & Co., by the committee of which Mr. Tripp was chairman and Homer Loring and John R. McGinley the other members. The following is abstracted from the circular in question:

Westinghouse, Church, Kerr & Co., Inc. (formerly Electric Properties Corporation), was organized, not only to do a construction and engineering business, but also for the purpose of engaging in the business of financing public utilities and was for a time active in the latter business. Of late years, however, it has gradually withdrawn from such financing business because that field has become more and more hazardous, and it is now engaged solely in the engineering and construction business.

Westinghouse Electric & Manufacturing Company is the largest stockholder of Westinghouse, Church, Kerr & Co., Inc., owning 9,599 shares of its preferred stock and 21,915 shares of its common stock, and the two companies have long been closely identified in the eyes of the public. It has seemed that Westinghouse, Church, Kerr & Co., Inc., has been handicapped in procuring business because of a belief on the part of prospective clients that if they employed it as their construction engineers they would be expected to purchase Westinghouse Electric equipment. On the other hand the Electric Company has felt that it should withdraw from any interest in the engineering and construction business, because it is a field foreign to its normal business activities and its interest therein has not been viewed with favor by contruction engineers competing with Westinghouse, Church, Kerr & Co., Inc. It has therefore appeared that it would be to the interest of both companies if the association could be terminated.

The Electric Company, however, has not desired to terminate its interest in your company unless such termination could be effected without embarrassment to the other stockholders, and indeed to their advantage. It has considered it essential that there should be associated with your company in its place, prominent interests of the highest standing and reputation, and with an established engineering and construction business. Dwight P. Robinson, president of Dwight P. Robinson & Co., Inc., has therefore recently been approached with a view of interesting him and his company in a union or merger with your company.

Mr. Robinson has been engaged in the engineering and construction business for the past twenty-five years, and formerly was a member of the firm of Stone & Webster. For many years he was president of the Stone & Webster Engineering Corporation. In 1918 he resigned from Stone & Webster and organized his own company, Dwight P. Robinson & Co., Inc., in which he interested prominent financial and business interests. The Electric Company and Guy E. Tripp, among others, became minority preferred and common stockholders, they having in view that such an interest might later tend to bring about a union or merger such as is now proposed.

The Robinson Company has built up a capable organization and now has on hand large and important construction contracts under which the uncompleted work amounts to approximately $14,000,000. Westinghouse, Church & Co. now has on hand contracts under which the uncompleted work amounts to approximately $8,000,000. The engineering and construction work of the two companies is largely supplemental, for the Robinson Company has been primarily engaged in power plant construction, while your company has been primarily engaged in railroad and industrial construction work. It is believed that the new company should become one of the largest and most successful in the construction and engineering business.

Under the plan a new corporation, probably under the Virginia law, will be formed or will result from a merger, which will be called Dwight P. Robinson & Co., Inc., or by a similar name. The new company will acquire, subject to their liabilities, the good-will, uncompleted contracts, business and all other assets of both Westinghouse, Church Kerr & Co., Inc., and the present Dwight P. Robinson & Co., Inc., except such assets as may be required to make any cash payments necessary to consummate the plan. It is estimated that upon consummation of the plan the new company will have initial net assets of approximately $2,500,000, exclusive of good-will, and no funded debt.

The plan provides for the retirement for cash of certain shares of both companies, the exchange of other shares for shares in the new company and the issuing of shares in the new company for these purposes.

Obituary

Charles A. Beider, assistant manager of sales of the **National Malleable Castings Company,** Cleveland, Ohio, died in that city on March 13, at the age of 35 years.

David Newlin Balderston, of Elizabeth, N. J., who was for about 22 years connected with the **Electro Dynamic Company,** Bayonne, N. J., in the capacity of engineer and superintendent of the axle light department, died on March 22, at Philadelphia, Pa.

Trade Publications

PNEUMATIC BRAKE EQUIPMENT.—The Westinghouse Air Brake Company, Pittsburgh, Pa., has issued catalogue 2021, which briefly describes and illustrates the standardized UC Westinghouse brake equipment for steam road passenger trains, which, with simple electric attachments, is said to represent the most improved form of electro-pneumatic train brake for both electric and steam road passenger trains.

BOILER MAKERS' TOOLS.—A new and attractive book which will interest boiler makers has just been published by J. Faessler Mfg. Company, Moberly, Mo. Its 68 pages include a recently developed line of roller expanding and flaring tools for locomotive superheater tubes, locomotive arch tubes, and stationary water tube and marine boiler tubes. Special types of expanders are included for Stirling, B. & W., and Heine boilers. These and other Faessler tools are fully described in detail and illustrated.

Financial and Construction

Railway Financial News

GUARANTEE OF FEDERAL COMPENSATION.—See article entitled "Roads That Did Not Accept Six Months' Guaranty," on a preceding page of this issue.

CANADIAN NORTHERN.—William A. Read & Co. have formed a syndicate to offer $12,000,000 5½ per cent three and five-year gold notes, due 1922 and 1924. The notes are being offered on a 6.90 per cent basis. The notes are unconditionally guaranteed by the Dominion of Canada. Each maturity is for $6,000,000. The three-year notes are being offered at 94.64 and interest, and the five-year maturity at 94.50 and interest.

CANADIAN PACIFIC.—A syndicate headed by the Guaranty Trust Company will offer $12,000,000 6 per cent gold certificates to be issued under the Philadelphia plan. These certificates will be dated April 1, 1920, and mature $500,000 semi-annually from October 1, 1920, to April 1, 1932. They will be offered to yield from 6¾ per cent to 6⅝ per cent. The issue will be secured by new equipment valued at $15,000,000, and title to this equipment will be vested in the Union Trust Company of Pittsburgh, as trustee, the equipment to be leased to the Canadian Pacific.

CHICAGO & WESTERN INDIANA.—This road has applied to the Public Utilities Commission of Illinois for an order authorizing the execution of the Equipment Trust Agreement and notes in the aggregate amount of $279,000 for a period of 15 years.

MISSOURI & NORTH ARKANSAS.—Festus J. Wade, of St. Louis, Mo., has resigned as receiver and has been succeeded by C. A. Phelan, general manager of the road.

NORFOLK & SOUTHERN.—This railroad asks an extension for two years at 7 per cent, of $1,000,000 6 per cent collateral trust notes which mature April 1.

PARIS & MOUNT PLEASANT.—R. W. Wortham, of Paris, Texas, has been appointed receiver. The road operates between Paris, Texas, and Mount Pleasant, 51 miles.

VIRGINIAN.—A syndicate consisting of the National City Company, Kissel, Kinnicutt & Co., and Lee, Higginson & Co., are offering $5,200,000 6 per cent equipment trust certificates in instalments of $260,000 each. The certificates mature in six months to ten years and are offered on a 7 per cent basis.

Railway Construction

ALASKAN ENGINEERING COMMISSION.—Between 1,000 and 2,000 men will be employed at Anchorage, Alaska, and be sent north in April to resume construction work on the southern and northern divisions of the Alaska Northern. It is expected that the laying of rails will be completed by the Fall of 1921. All track will be ballasted and in condition for operation by the Fall of 1922, it is estimated. There is now a gap of about 100 miles between the end of steel on the southern, or Seward division, and the end of steel on the northern, or Fairbanks division. A bridge with a span of 504 ft. will be built across the Susitna river, costing approximately $500,000. Bids have been received and the work is expected to begin in April. The entire program is under the direction of William Gerig, assistant chief engineer.

ILLINOIS CENTRAL.—Active construction work on the new Markham switching yards of the Illinois Central, between Harvey, Ill., and Homewood, began on March 21.

PHILADELPHIA & READING.—A contract has been given to the Smith-McCormick Company, Easton, Pa., for the construction of a new bridge over the Susquehanna river at Harrisburg, Pa., a double track concrete arch bridge about 3,500 ft. long, consisting of 46 arches. The new bridge is to replace the existing single track deck truss bridge.

Railway Officers

Executive

F. A. Lehman and **John Purcell,** assistants to the federal manager of the Atchison, Topeka & Santa Fe, have been appointed assistants to the vice-presidents, with headquarters at Chicago, the positions they occupied prior to government control.

Charles E. Denny, whose election as vice-president and general manager of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, was announced in the *Railway Age* of March 5, page 745, was born at Washington, D. C., in 1879 and received his education at the Pennsylvania State College. After six years' service with the Union Switch & Signal Company, he entered railway service on May 16, 1905, as assistant signal engineer on the Lake Shore & Michigan Southern. From May, 1906, to September, 1913, he was signal engineer, his jurisidiction being extended on May 16, 1912, to include the Lake Erie & Western. From 1913 until August, 1914, he was special engineer to the vice-president of the New York Central Lines, with headquarters at Chicago. In August, 1914, he was appointed assistant general sales manager of the Union Switch & Signal Company, and prior to November, 1916, was successively assistant general manager and assistant to the president. On the latter date he was appointed assistant to the president of the New York, Chicago & St. Louis, and was later promoted to assistant general manager and, finally, to assistant federal manager, retaining the latter position until March 1, 1920, when he was elected vice-president and general manager.

C. E. Denney

F. B. Miller, vice-president and general manager of the Colorado, Wyoming & Eastern, with office at Laramie, Wyo., has been elected president, with the same headquarters, succeeding **T. Callaway,** who has resumed the position of vice-president, with office at New York, which he held prior to federal control.

A. M. Burt, assistant director in charge of maintenance of the Division of Operation of the Railroad Administration, and chairman of the Automatic Train Council committee, and previous to federal control general manager of the Northern Pacific, has been appointed assistant to the vice-president in charge of operation of the same road.

E. W. Peabody, whose appointment as assistant to the receiver of the Missouri, Kansas & Texas Lines, with headquarters at St. Louis, Mo., was announced in the *Railway Age* of March 5 (page 745), was born at St. Louis, on February 9, 1874. Graduating from the University of Chicago in 1896, he entered railway service in 1899 as a trainmaster on the Atchison, Topeka & Santa Fe. From 1903 to 1907, he was trainmaster on the Northwestern Pacific at Eureka, Cal. In 1907 he was appointed traffic and transportation manager of the American Railroad of Porto Rico, with headquarters at San Juan, Porto Rico, retaining that position for two years. In 1909 he returned to the United States and was employed as chief clerk to the general manager of the

Atchison, Topeka & Santa Fe, Western Lines, at Amarillo, Tex. From 1911 to 1913 he was traveling accountant on the Illinois Central and in 1913 he was employed as a statistician on the Missouri, Kansas & Texas, remaining in that position until 1918, when he was appointed treasurer for the receiver. He continued in this position until his present appointment as assistant to the receiver, which was effective March 1.

Financial, Legal and Accounting

Fred P. Johnson, whose appointment as general auditor of the Missouri Pacific, with headquarters at St. Louis, Mo., was announced in the *Railway Age* of February 27 (page 658), was born in New York on January 27, 1874. He entered railway service on February 5, 1889, as a messenger boy in the general auditor's office of the Missouri Pacific. Prior to 1902 he occupied various clerical positions in the disbursement office and during the latter year he was placed in charge of the department handling special operating statistics. In 1907 he was given charge of rate litigation during the period when passenger rates were reduced from three cents to two cents a mile by Acts of various state legislatures. Two years later he was promoted to chief accountant of the operating department and, on June 1, 1911, was placed in charge of the annual and interstate reports. On August 1, 1912, he was appointed auditor of disbursements and retained that position until March 1, 1913, when he was promoted to assistant general auditor. During federal control he was federal auditor, which position he retained until his present promotion to general auditor, effective March 1, 1920.

Operating

John J. Mantell, during federal control terminal manager at Jersey City for the Eastern and Allegheny regions, and prior to federal control general superintendent of the Erie, Lines East, who has been appointed manager of the New York region of the same road, was born in Elmira, N. Y., and educated in the public schools and Elmira Academy. He began railroad work in June, 1899, as clerk and stenographer in the superintendent's office of the Erie. Later he served consecutively as yard clerk, chief yard clerk, yardmaster and general yardmaster at Croxton and Jersey City, N. J., and Susquehanna, Pa. He then became special agent in the office of the general superintendent at New York and afterwards served respectively as trainmaster of the Delaware and Jefferson divisions, terminal trainmaster at Jersey City and superintendent of the Wyoming division. In 1915 he was appointed superintendent of terminals at Jersey City and in May, 1917, became general superintendent, Lines East, as mentioned above.

J. J. Mantell

D. A. MacMillan has resumed his duties as trainmaster of the Montana division of the Northern Pacific, with headquarters at Livingston, Mont.

Benjamin F. Riggs, has been appointed trainmaster of the Dakota division of the Northern Pacific, with headquarters at Jamestown, N. D., succeding F. L. Birdsall, transferred.

George L. Hickey, superintendent of transportation of the Los Angeles & Salt Lake, the St. Joseph & Grand Island, the Union Pacific and the Oregon Short Line, has been appointed general manager of the Nevada Northern, with headquarters at San Francisco, Cal., succeding to a position which has been vacant since the death of **Le Grand Cannon,** notice of which appeared in the *Railway Age* of February 20 (page 600).

Augustus E. Ruffer, transportation assistant of the Eastern region during federal control, who has been appointed general superintendent of transportation of the Erie, was born on July 23, 1875, at Port Jervis, N. Y. He began railroad work on October 19, 1889, as messenger for the Erie and served for two years in the despatcher's and superintendent's office. He then was appointed assistant clerk to the chief despatcher and from 1894 to 1896 was a clerk in the superintendent's office. From 1896 until 1905 he served in the office of the superintendent of transportation in various capacities. He left the Erie in 1905 to become special agent in the operating department of the Lehigh Valley, but returned in 1906 to serve the Erie in a similar capacity. On May 1, 1911, he was appointed trainmaster of the Susquehanna division and in May, 1912, was transferred to the New York division as assistant superintendent, with headquarters at Jersey City, N. J. On December 1, 1915, he was appointed superintendent of the Wyoming division at Scranton, Pa., and was promoted to the position of superintendent of transportation in 1917.

A. E. Ruffer

A. E. Wallace, assistant general superintendent of the Erie, Lines West, with headquarters at Youngstown, Ohio, who has been appointed manager of the Chicago region of the same road, with headquarters at Chicago, under the new plan of organization, was born on March 3, 1879, at Nashau, N. H. He was educated at Harvard University and began railroad work in November, 1902, as clerk for the Great Northern at Larimore, N. D. Later he became time keeper. In 1904 he entered the service of the Chicago, Rock Island & Pacific as yard clerk. Subsequently he served as time keeper and chief clerk to the superintendent of the same road at Cedar Rapids, Iowa. In January, 1907, he went to the Chicago, Burlington & Quincy as special inspector at Alliance, Neb. From September, 1909, until February, 1911, he was successively assistant extra gang foreman, assistant roadmaster, assistant trainmaster and trainmaster. In September, 1911, he became special inspector, with headquarters at Chicago. Later he served on the staff of the second vice-president at Chicago. He then was appointed assistant superintendent, with headquarters at St. Paul, Minn. In July, 1912, he returned to the Chicago, Rock Island & Pacific as superintendent, with headquarters at Cedar Rapids, Iowa. He was transferred to Manly, Iowa, in February, 1913. He entered the service of the Erie early in 1918 as general superintendent of the Chicago and Marion

A. E. Wallace

divisions, with headquarters at Chicago. Several months afterwards he was transferred to Youngstown, Ohio, as assistant general superintendent.

J. Cannon, whose appointment as assistant general manager of the Missouri Pacific, with headquarters at St. Louis, Mo., was announced in the *Railway Age* of March 5 (page 745), was born at Cairo, Ill., on May 16, 1872. He entered railway service in 1886 as a clerk on the Illinois Central. From that date until 1903, he was employed as a clerk in the offices of the assistant superintendent, superintendent, general superintendent of transportation and the general manager, with the exception of one year during which he was employed as a brakeman. In October, 1905, he was appointed a superintendent on the Missouri Pacific, and prior to 1915 was employed on various divisions in that capacity. On October 1, 1915, he was promoted to general superintendent and four years later to general superintendent of transportation. This position he retained until his present promotion to assistant general manager, which was effective March 1.

Arthur C. McDannel, whose appointment as general superintendent and traffic manager of the Detroit, Bay City & Western, with headquarters at Bay City, Mich., was announced in the *Railway Age* of February 20 (page 596), was born at Bryan, Ohio, on February 3, 1879. He entered railway service in 1898 as a car checker on the Ann Arbor at Toledo, Ohio. The following year he was appointed an operator and ticket and freight clerk on the Grand Trunk at Owosso, Mich., and, later in that year, an operator for the Postal Telegraph Company in the same city. In 1900 he was appointed a clerk on the Copper Range at Houghton, Mich., and in August, 1900, returned to the service of the Postal Telegraph Company as an operator at Toledo, Ohio. Later in the same year he was appointed an operator on the Great Northern at Everett, Wash., and from August, 1901, to August, 1909, was successively operator, cashier, yardmaster and general agent on the Ann Arbor at Frankfort, Mich. From September, 1909, to September, 1910, he was traffic manager for the Buckley & Douglas Lumber Company, Manistee, Mich. On the latter date he was appointed auditor of the Detroit, Bay City & Western, with headquarters at Bay City, Mich., and later was promoted to auditor and superintendent. During federal control he was assistant to the president, which position he retained until his present appointment as general superintendent and traffic manager, in which position he succeeds **C. S. Ruttle,** who has retired.

A. C. McDannel

William M. Whitenton, whose appointment as assistant chief operating officer of the Missouri, Kansas & Texas, with headquarters at Dallas, Tex., was announced in the *Railway Age* of March 5 (page 745), was born in Texas in 1869. He entered railway service in 1884 as an operator on the Missouri, Kansas & Texas, and, prior to 1890, was successively station agent and train despatcher on the same road. From 1890 to 1898, he was successively train despatcher and chief train despatcher on the Texas & Pacific. In 1898 he was employed as a train despatcher on the Chicago, Rock Island & Pacific and, prior to 1914, was successively trainmaster, superintendent, general superintendent and general manager. From 1914 to 1915, he was operating expert with a special committee on smoke abatement in the Chicago terminals and in the latter half of 1915, he returned to the Texas & Pacific as operating assistant on the staff of the vice-president. On January 1, 1917, he re-entered the service of the Missouri, Kansas & Texas as a trainmaster and was subsequently promoted to superintendent and later to general superintendent, which position he retained until his recent promotion to assistant chief operating officer.

Henry Shearer, general superintendent of the Michigan Central and the Detroit Terminal, with headquarters at Detroit, Mich., has been promoted to general manager of the former road. Mr. Shearer was born at Galien, Mich., and entered railway service on June 5, 1892, as a clerk in the freight office of the Michigan Central at Matteson, Ill. A year later he was promoted to freight agent at Porter, Ind. In 1895, he was appointed agent at Chicago Heights, Ill., remaining in that position until 1899, when he was transferred to Michigan City, Ind. In November, 1899, he was promoted to traveling freight agent, with headquarters at Chicago, remaining in that position until 1900, when he was promoted to chief clerk in the general freight department. From August, 1902, to January, 1903, he was agent at Jackson, Mich., and in January, 1903, he was appointed chief clerk to the general manager, with office at Detroit. He retained this position until October, 1909, when he was promoted to division superintendent of the Canadian division, with office at St. Thomas, Ont. In December, 1912, he was promoted to assistant general manager at Detroit and, in September, 1916, he was promoted to general superintendent.

F. H. Hammill, general superintendent of the northern district of the Union Pacific, with headquarters at Omaha, Neb., has been appointed assistant general manager of the Eastern lines of the Chicago & North Western, with headquarters at Chicago, effective March 1. Mr. Hammill was born at Rockford, Ill., and entered railway service in 1886 as an operator on the Chicago & North Western. From this time until 1902 he was consecutively an operator and bill clerk on the Chicago, Milkaukee & St. Paul at Rockford, a freight brakeman for ten years and then chief train despatcher on the same road, after which he was chief train despatcher of the Galena division of the Chicago & North Western. From 1902 to July, 1905, he was trainmaster on the Iowa division of the Northwestern. On the latter date he was promoted to superintendent of the Madison division. On January 23, 1906, he was transferred to the Sioux City division and in November, 1906, he was transferred to the Northern Wisconsin division. In November, 1907, he was again transferred to the Iowa division, where he remained until May, 1911, when he was transferred to the Western Iowa division. In February, 1913, he was promoted to general superintendent on the North Western, which position he held until October, 1917, when he was appointed general superintendent of the newly-created Northern district of the Union Pacific, with headquarters at Omaha. Mr. Hammill remained in this position until his recent appointment as assistant general manager of the Chicago & North Western.

F. H. Hammill

Traffic

E. K. Bryan, assistant general freight agent on the Illinois Central, with headquarters at Memphis, Tenn., has been appointed traffic expert of the newly organized Southern Freight Rate Committee, with headquarters at Atlanta, Ga., effective April 1.

William E. Rosenbaum resigned, effective March 1, as secretary of the St. Louis (Mo.), Eastern District Freight Traffic Committee of the Divisions of Traffic and Public Service of the United States Railroad Administration to engage in private business as a consulting traffic manager, with headquarters at St. Louis.

C. J. McDonald, assistant to the regional director of the Central Western region of the United States Railroad Administration, with office at San Francisco, Cal., has been appointed general agent of refrigerator service of the Southern Pacific, with the same headquarters. This position has been created to handle the solicitation of traffic in fruit and perishable products.

B. F. Moffat, whose appointment as general freight agent of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., was announced in the *Railway Age* of March 5 (page 745), entered railway service on the Iowa Central at Marshalltown, Ia., in 1893. He remained with the Iowa Central in the auditing and traffic departments until 1912, when that line was taken over by the Minneapolis & St. Louis, since which time he has been in the service of the latter road in the traffic department. During the period of federal control he was assistant general freight agent, the position he held until his recent appointment, in which he succeeds **D. M. Denison,** whose promotion to freight traffic manager was announced in the *Railway Age* of March 5 (page 745).

Frank D. Gouldburg, whose appointment as general freight and passenger agent of the Detroit, Bay City & Western, with headquarters at Bay City, Mich., was announced in the *Railway Age* of February 20 (page 597), was born at Bailey, Mich., on August 30, 1882. He entered railway service in 1900 as an agent and operator on the Chicago & West Michigan, now part of the Pere Marquette. In 1903 he was employed as a relief agent on the Grand Rapids & Indiana, and the following year entered the employ of the Manistique, Marquette & Northern Railway & Car Ferry, as general agent at Manistique, Mich. In 1905 he entered the service of the Detroit & Mackinac as an agent and continued in that capacity until 1918, when he was appointed tariff inspector in the general traffic department. In 1911 he was promoted to chief of the tariff bureau, remaining in that position until the consolidation of the Detroit & Mackinac and the Pere Marquette on November 15, 1918, at which time he entered the service of the Michigan Central as chief clerk to the assistant general freight agent at Detroit, Mich. On December 15, 1919, he was appointed corporate traffic representative of the Detroit, Bay City & Western, and the Port Huron Southern, which position he retained until his present promotion to general freight and passenger agent, which was effective March 1.

F. D. Gouldburg

Augustus F. Cleveland, whose appointment as assistant freight traffic manager of the Chicago & North Western, with headquarters at Chicago, was announced in the *Railway Age* of March 5 (page 740), was born at Chicago on September 19, 1875. After completing his education at Yale University in 1898, he attended the Cleveland Law School and in 1912 was admitted to the Ohio bar. He entered railway service in 1898, as a general agent on the Chicago & North Western at Atlanta, Ga., being transferred later to Cincinnati, Ohio, and finally to Cleveland. In 1911 he was appointed general agent at Philadelphia, Pa., retaining that position until 1912, when he was appointed assistant general freight agent at Chicago, which position he held until his present promotion.

Loren F. Vosburgh, whose appointment as traffic manager of the New York Central, with headquarters at New York, was noted in the *Railway Age* of March 5 (page 745) was until March 1 passenger traffic manager of that road. Mr. Vosburgh was born at Fayette, Mich., on April 7, 1868. He began railroad work on February 16, 1892, as assistant ticket agent of the Lake Shore & Michigan Southern at Adrian, Mich. From April, 1895, until December, 1896, he was a ticket seller at the La Salle Street station, Chicago. On the latter date he became passenger agent at Chicago and in June, 1900, city passenger and ticket agent at the same place. In January, 1903, he was appointed general agent of the passenger department and in November, 1906, was transferred to New York as general eastern passenger agent of the New York Central Lines. He became assistant general passenger agent at New York in February, 1910, and the following September was promoted to general passenger agent. On August 1, 1917, he was promoted to passenger traffic manager, with the same headquarters.

L. F. Vosburgh

Mechanical

W. O. Thompson, superintendent of rolling stock of the New York Central Lines West of Buffalo, with headquarters at Cleveland, Ohio, who has been appointed general superintendent of rolling stock, with office at Buffalo, N. Y., was born in Clayton, Mich., in 1863, and graduated from Adrian (Mich.), High School. He began railroad work in 1882 on the Fort Wayne, Jackson & Saginaw, which later became a part of the Lake Shore & Michigan Southern. From 1884 to 1890 he served as a locomotive engineman and then was appointed traveling engineer, remaining in that position until August, 1893. He was then for some years an engine despatcher and in 1901 was appointed general locomotive inspector of the New York Central & Hudson River. The following year he was appointed superintendent of motive power of the Rome, Watertown & Ogdensburg division, and in 1907 became district master car builder at East Buffalo, N. Y. He was appointed superintendent of rolling stock of the New York Central Lines West of Buffalo during 1915, from which position he was promoted to general superintendent of rolling stock on March 1.

W. O. Thompson

L. P. Michael, chief draftsman in the motive power and car departments of the Chicago & North Western, has been

appointed mechanical engineer, with headquarters at Chicago, succeeding **J. C. Little,** resigned.

G. L. Lambeth, master mechanic of the Mobile division of the Mobile & Ohio at Whistler, Ala., has been appointed superintendent of motive power and car equipment, with headquarters at Mobile, Ala., effective March 20, succeeding **J. J. Thomas, Jr.,** resigned; **A. R. Teague** has been appointed to succeed Mr. Lambeth as master mechanic at Whistler.

R. Porter Smith, chief draftsman of the Georgia Railroad, who has been appointed mechanical engineer of that road, the Atlanta & West Point and the Western Railway of Alabama, with headquarters at Augusta, Ga., was born on January 3, 1875, in Olean, N. Y. He received his education in the public schols of Olean and began railway work in February, 1899, with the Western New York & Pennsylvania at that city. When that road became part of the Pennsylvania he remained with it until August, 1901, as an employee of the boiler, machine and erecting shops. He was then transferred to the drawing room, remaining there until October, 1903, when he was appointed roundhouse foreman. He resigned in February, 1906, to go with the Georgia Railroad as chief draftsman, in which capacity he acted continuously from April 2, 1906, until March 1, 1920, the date of his recent appointment as mechanical engineer.

Frank H. Hardin, assistant to the federal manager of the New York Central, who on March 1 was appointed chief engineer of motive power and rolling stock, with headquarters in New York, was born on June 14, 1886, in Gainsville, Ga. He graduated from the Georgia School of Technology in 1908 and then took a post graduate course at Columbia University. All his railroad service has been with the New York Central, he having begun on August 1, 1909, as a special apprentice at the West Albany shops. After several minor promotions he was made enginehouse foreman at Tupper Lake, N. Y., in June, 1913, and in November of that year was transferred to Utica, N. Y., as assistant foreman, where he remained for one year, or until November, 1914. At that time he was appointed special engineer in the office of the assistant to the president in New York. From March, 1917, to November, 1918, he was master mechanic of the Adirondack division, with headquarters in Utica. On the latter date he was appointed assistant to the federal manager of the New York Central at New York, holding that position until March 1, 1920.

Engineering, Maintenance of Way and Signaling

E. S. Pennebaker has been appointed corporate engineer of the Texas & Pacific, with headquarters at Dallas, Tex. This corrects an error in the *Railway Age* of March 5 (page 751), listing Mr. Pennybaker as chief engineer.

E. W. Hammond, acting engineer maintenance of way of the Buffalo, Rochester & Pittsburgh with headquarters at Rochester, N. Y., has been appointed engineer maintenance of way with the same headquarters; and **J. B. Oatman,** acting division engineer at Du Bois, Pa., has been appointed division engineer with the same headquarters, effective March 15.

F. S. Schwinn, engineer on the valuation committee of the International & Great Northern, with office at Houston, Tex., has been appointed chief engineer, with the same headquarters. Mr. Schwinn was born in 1889 and received his technical education at the Lewis and Armour Institutes of Technology, Chicago. He entered railway service in 1907 as a rodman on the Chicago & Alton, at Joliet, Ill. The following year he was appointed a rodman on the Southern Pacific, with headquarters at Sacramento, Cal., and consecutively to 1913 was draftsman, instrument man and assistant engineer. In the latter year he was transferred to the Louisiana lines, as assistant engineer, with headquarters at Lafayette, La. In 1914 he was appointed assistant superintendent in charge of maintenance of those lines and in 1917, was appointed assistant superintendent of the Gulf division of the International & Great Northern, with headquarters at Palestine, Tex. The following year he was appointed engineer on the valuation committee, which position he retained until his recent appointment.

Harry E. Barlow, whose appointment as chief engineer of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn., was announced in the *Railway Age* of March 5 (page 739), was born at Baraboo, Wis., on March 25, 1880, and graduated from the University of Minnesota in 1903. He entered railway service in June, 1896, as an office boy in the general freight department of the Chicago, St. Paul, Minneapolis & Omaha. From 1899 to September, 1900, he was a chainman, and, prior to 1901, was successively rodman and instrument man, on the same road. In June, 1902, he was appointed assistant engineer, which position he retained continuously until his present promotion to chief engineer, as mentioned above.

H. E. Barlow

William H. Hoyt, whose appointment as chief engineer of the Duluth, Missabe & Northern, with headquarters at Duluth, Minn., was announced in the *Railway Age* of March 5 (page 740), was born at Owatonna, Minn., on October 13, 1867. Graduating from the University of Minnesota in 1890, he entered railway service the following year as an assistant engineer on the Duluth, Missabe & Northern. In 1901, he was appointed principal assistant city engineer of Duluth, Minn., retaining that position for two years, when he was again appointed an assistant engineer on the Duluth, Missabe & Northern. In 1905, he was promoted to assistant chief engineer, which position he retained until his present promotion to chief engineer as above noted.

W. H. Hoyt

Harold Knight, assistant superintendent of maintenance of the Erie during and prior to federal control, with headquarters at New York, who has been appointed regional engineer of the Ohio region of the same road, with headquarters at Youngstown, Ohio, was born on October 28, 1881, at Stockport Station, Delaware County, N. Y. He was educated at Sheffield Scientific School, Yale University, and began railroad work in 1904 as rodman for the Erie at Elmira, N. Y. The following year he became transitman and shortly after was appointed assistant engineer at Hornell, N. Y. In 1908 he was promoted to division engineer of the Allegheny division at Salamanca. He was transferred in the same capacity to Jersey City, N. J., in 1912, and in 1914 was appointed signal engineer with the same headquarters. He was appointed assistant superintendent of maintenance of the Erie in May, 1917.

Herman Rettinghouse, chief engineer of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn., has retired after 30 years' service with the Northwestern system. Mr. Rettinghouse was born in Germany on July 30, 1861. He was educated in Germany and came to the United States in 1882, beginning railway service in 1883 as a rodman on construction work on the St. Paul extension of the Wisconsin Central. The following year he became connected with the Milwaukee, Lake Shore & Western, now a part of the Chicago & North Western, and was successively, leveler, instrument man and assistant engineer in charge of location, construction and maintenance. He was then engaged in general engineering practice at Ashland, Wis., from 1893 to 1897, including three years' service as city engineer of that city. He later returned to the North Western and was appointed assistant engineer in charge of construction and maintenance until May, 1900 From the latter date until February, 1905, he was superintendent of bridges and buildings of the Ashland division. He was later division engineer of the Southern division of the Wisconsin Central, resigning from that position in January, 1907, to become division engineer in charge of maintenance of the Chicago & North Western, with office at Boone, Ia. In April, 1912, he was promoted to superintendent of the Iowa & Minnesota division, with headquarters at Mason City, Ia., from which position he was promoted to chief engineer of the Chicago, St. Paul, Minneapolis & Omaha, on Nov. 1, 1913.

H. Rettinghouse

Purchasing and Stores

Leo M. Sullivan, whose appointment as purchasing agent of the Texas & Pacific, with headquarters at Dallas, Tex., was announced in the *Railway Age* of March 5, (page 751), was born at Denison, Tex., on August 29, 1891. After graduating from the Christian Brothers' College, St. Louis, Mo., he began railway service in 1907 on the Ohio River & Columbus, as a ticket agent at Ripley, Ohio. The same year he became bookkeeper for the American Coal Company at Ripley. On March 1, 1908, he again entered railway service as a yard clerk on the Chicago, Rock Island & Pacific and prior to 1908 was index clerk and bill clerk at Argenta, Ark. From December, 1908, to May, 1910, he was a stenographer in the chief dispatcher's office at El Reno, Okla., and later held various positions in the superintendent's office. In 1910 he was employed as a correspondence clerk in the engineering department of the Cincinnati, Hamilton and Dayton, and was later promoted to secretary to the general superintendent, and, finally to secretary to the assistant to the president at Cincinnati, Ohio. From April to June, 1911, he was trainmaster's clerk on the Missouri, Oklahoma & Gulf, at Calvin, Okla., and the same year entered the employ of the Missouri Pacific as a stenographer in the office of the superintendent of transportation. Later he served as a stenographer in the office of the first vice-president of the same road. From November, 1911, to March, 1915, he was secretary to the vice-president, resigning from that position in 1915, to become secretary to the first vice-president of the Texas & Pacific. From 1915, to October, 1916, he was chief clerk to the first vice-president, and, on the latter date, was transferred as chief clerk to the receiver and the president. This position he held until his recent promotion to purchasing agent.

L. M. Sullivan

Special

Albert H. Jones, whose appointment as supervisor of wages of the St. Louis-San Francisco, was announced in the *Railway Age* of March 5, page 747, was born on January 2, 1886. He entered railway service with the Atchison, Topeka & Santa Fe, as an office boy in the superintendent's office at Las Vegas, N. M. In April, 1905, he was transferred to the store department at Topeka, Kan., remaining there for a year, when he returned to the superintendent's office at Las Vegas as chief clerk. On March 1, 1911, he was appointed chief of the Loss and Damage bureau in the general superintendent's office at La Junta, Colo. Later in the same year he was appointed chief clerk, retaining this position until 1914, when he resigned to become trainmaster on the Detroit, Toledo & Ironton, and consecutively until 1918, was general storekeeper, purchasing agent and superintendent of that road. In June, 1918, he entered the service of the St. Louis-San Francisco, handling wage and schedule matters, which position he retained until the close of federal control, when he was appointed supervisor of wages of the St. Louis-San Francisco, with headquarters at St. Louis, Mo., a newly created position.

A. H. Jones

General

CHICAGO, BURLINGTON & QUINCY

The following appointments have been made in the traffic department of the Chicago, Burlington & Quincy, in addition to those announced in the *Railway Age* of February 27, page 160, and of March 12, page 802:

H. R. Todd	General	agent	Birmingham, Ala.
Alex. Stocks	"	"	Boston, Mass.
L. J. Doran	"	"	Butte, Mont.
H. K. Miles	"	"	Cincinnati, Ohio.
E. H. Smith	"	"	Cleveland, Ohio.
C. J. Rohwitz	"	"	Dallas, Tex.
T. P. Hinchcliff	"	"	Detroit, Mich.
W. W. Elliott	"	"	Los Angeles, Cal.
F. D. Hunter	"	"	Milwaukee, Wis.
G. B. Magruder	"	"	New Orleans, La.
J. A. Martin	"	"	New York City.
W. S. Dewey	"	"	Philadelphia, Pa.
W. V. Taffner	"	"	Pittsburgh, Pa.
R. W. Foster	"	"	Portland, Ore.
H. H. Van Swearingen	"	"	San Francisco, Cal.
G. B. Smith	"	"	Seattle, Wash.
H. A. Bradt	"	"	Spokane, Wash.
A. R. Brown	"	"	Winnipeg, M., Can.

CHICAGO, ROCK ISLAND & PACIFIC

The following officers have been appointed on the Chicago, Rock Island & Pacific, in addition to those announced in the

Railway Age of March 12, page 803, and of March 19, page 994:

Robert H. Ford..Assistant chief engineer....Chicago.
I. L. Simmons...Bridge engineer..... "
A. T. Hawk.....Engineer of buildings..... "
H. K. Lowry....Signal engineer..... "
R. C. Sattley.....Valuation engineer..... "
J. G. Wishart....Office engineer..... "
P. M. La Bach..Engineer of water service.. "
Garrett Davis....Construction engineer..... "
E. F. Manson....Assistant engineer..... "

CINCINNATI, INDIANAPOLIS & WESTERN

In addition to the elections and appointments on the Cincinnati, Indianapolis & Western, announced in the *Railway Age* of March 5 (page 740), the following appointments have been made in the traffic department:

P. M. Havens...Division freight agent.....Indianapolis, Ind.
S. C. Farrington.Commercial agent..... "
D. C. Odell.....Division freight agent.....Springfield, Ill.
F. E. Emery.....General western agent....St. Louis, Mo.
L. F. Root.....General agent.....Chicago.
C. H. Jackson... " " .....Pittsburgh, Pa.
W. Vandenburgh. " " .....Memphis, Tenn.
Edward Merchant.District passenger agent...Cincinnati, Ohio.
E. A. Doyle.....General agent..... "

ERIE

The following appointments on the Erie are additional to those given in the *Railway Age* of February 20, page 541, and February 27, page 661:

EXECUTIVE DEPARTMENT

C. S. GoldboroughAssistant to president.....New York.
C. P. Crawford..General agent ..... "
J. G. Walsh.....Fin. asst. to pres. & gen. c'l. "
C. R Stewart....Consulting engineer..... "

LEGAL DEPARTMENT

H. A. Taylor.....Gen. solicitor (ef. Mar. 15).New York.
T. H. Burgess...General attorney..... "
D. F. Minard.... " " ..... "
M. B. Pierce....Asst. gen, council..... "
H H. Hull.....Asst. general solicitor..... "
H T. Whipple... " " ..... "
G. R. James.....Solicitor ..... "
C. T. Black..... " ..... "
W. S. Throop...Claims attorney..... "

FINANCIAL DEPARTMENT

W. B. Bancker..Assistant treasurer.....New York
S. Z. Earle..... " " .....Youngstown, Ohio.
G. H. Smith..... " " .....Hornell, N. Y.
H. W. Trumpler. " " .....Chicago.
B. A. VanTassel. " " .....New York.

ACCOUNTING DEPARTMENT

F. A. Clark.....General auditor.....New York.
A. S Moran.....Auditor freight accounts.. "
J. Prigge .....Asst. auditor frt. accounts. "
J. K. Thompson..Assist. to comptroller.... "
J. G. Austin.....Auditor of disbursements.. "
T. A. QuackenbushAsst. aud. of disbursements. "
P. J. Reilly.....Auditor pass. accounts.... "

ENGINEERING DEPARTMENT

Frank A. Howard.Engineer of structures..... "
C. H. Splitstone..Sup of Cons. and surveys.. "
G. S. Fanning....Office engineer ..... "
M. A. Baird.....Signal engineer..... "
Roland L. Turner.Engineer of grade crossings. "
Lee W. Walter...Inspecting engineer..... "
Henry F. King...Special engineer..... "

MECHANICAL DEPARTMENT

J. McMullen.....Supt. car dept.....Meadville, Pa.
T. F. Howley...Special agent..... "
F. M. Graff.....Supt. prod. & appren..... "
F. S. Brown.....Mechanical engineer..... "
W. A. Cotton....Mechanical accountant..... "
G. Eisenhauer ...Electrical engineer..... "
T. W. Dow.....Gen. air brake inspector.... "

TRAFFIC DEPARTMENT

E. T. Campbell..Freight traffic manager....New York.
R. H. Wallace...Passenger traffic manager.. "
James B. Ford...Freight traffic manager....Chicago.
A. K. Morris....Coal traffic manager.....New York.
Harry E. Bell....For. freight traf. manager. "
A. L. Moorshead.Industrial commissioner.... "
Henry Adams.....General freight agent..... "
H. Wilson ..... " " " .....Chicago.
H. W. Forward.. " " " ..... "
F. G. Lantz..... " " " .....Cincinnati, Ohio.
C. P. Morse.....Gen. frt. and pass. agent..New York.
J. F. Shinn.....General passenger agent..Chicago.
H. C. Holabird... " " " ..New York.
H. M. Wade.....Bagg., mail & exp. agent.. "
J. Buckley.....Gen. ea. passenger agent..

NEW YORK REGION

H. W. Andrus...Claim agent.....New York.
A. B. Shafer.....Supt. Del. & Jef. divs.....Susquehanna, Pa.
A. J. Davis.....Master mechanic.....Jersey City, N. J.
F. J. Dailey.....Asst. master mechanic....Dunmore, Pa.
Alonzo Ross.....Supt. of stores.....Jersey City, N. J.
S. J. Malloy.....Div. eng., N. Y. S. & W.; W. & E., G. L. div.....Jersey City, N. J.
J. P. Lowe.....Inspector suburban service. "
A. M. Kelly.....Chief trainmaster..... "
H. A Kelley.....Transportation inspector... "
F. H. Murray....Shop superintendent.....Susquehanna, Pa.

HORNELL REGION

E. M. Kain.....General agent, freight.....Buffalo, N. Y.
A. C. Hilton.....General agent, passenger.. "
A. W. Michelbach.Div. freight agent.....Elmira, N. Y.
T. R. Patton.....Div. passenger agent..... "
J. C. Moffatt....Div. freight agent.....Bradford, Pa.
B. C. Wedd.....Div. freight agent.....Rochester, N. Y.

CHICAGO REGION

J. W. Cofer.....Auditor .....Chicago.

FT. DODGE, DES MOINES & SOUTHERN

The Ft. Dodge, Des Moines & Southern's executive staff has been announced as follows:

C. H. Crooks....President and gen. man...Boone, Ia.
F. M. Johnston..Sec., treas., and auditor.... "
S. R. Dyer.....General counsel..... "
Charles Shackell.Traffic manager..... "
F. M. Steele.....Gen. frt and pass. agent.. "
C. M. Kelly.....Superintendent ..... "
W. L. Harvey....Car accountant..... "
D. K. Lewis.....Electrical engineer..... "
L. E. Gagnon....Supt. M. of W. and S.... "
R. L. Cooper.....Chief engineer..... "
John Duncan.....Master mechanic..... "
G. E. Motz.....Purchasing agent..... "

GULF, COLORADO & SANTA FE

The following officers have been appointed on the Gulf, Colorado & Santa Fe, effective March 1:

EXECUTIVE DEPARTMENT

F. G. Pettibone...Vice-president .....Galveston, Tex.

FINANCIAL DEPARTMENT

A. C. Torbert....Sec., treas. and trans. agent. "
L. C. Deming....Assistant secretary.....New York.
C. K. Cooper....Assistant treasurer..... "
D. L. Gallup.....Comptroller ..... "
G. N. Yard.....Paymaster .....Galveston, Tex.
D. W. McLeod...Auditor ..... "
H. J. Verion.....Assistant auditor..... "

LEGAL DEPARTMENT

S. T. Bledsoe....General counsel.....New York.
G. Lathrop.....General solicitor.....Chicago.

OPERATING DEPARTMENT

W. E. Maxson....Assistant gen. man.....Galveston, Tex.
V. C. James.....Asst. to gen. man..... "
S. C. Kirkpatrick. " " " ..... "

MECHANICAL DEPARTMENT

J. E. McQuillen..Mechanical supt..... "

TRAFFIC DEPARTMENT

J. S. Hershey....Gen. freight agent..... "
F. R. Dalzell.....Asst. gen, freight agent.... "
W. S. Keenan...General pass agent..... "
E. F. Adams.....Asst. gen. pass. agent..... "
J. B. Moore.....General baggage agent..... "

Gulf, Colorado & Santa Fe, continued

ENGINEERING AND MAINTENANCE DEPARTMENT

F. Merritt	Chief engineer	Galveston, Tex.
M. F. Temple	Prin. asst. engineer	"
K. B. Duncan	District engineer	"
E. Hanson	Signal engineer	"
J. L. Starkie	Office engineer	"
W. J. Smith	Architect	"
W. A. Hudson	Right of way agent	"
Terry, Cavin & Mills	General attorneys	"
Jno. S. Douglass	General claim agent	"
S. R. Biering	Freight claim agent	"
O. L. Clarke	Land and tax comm	"
H. M. Seaman	Asst. land and tax comm	"

PURCHASING DEPARTMENT

T. O. Wood	Purchasing agent	Cleburne, Tex.
E. S. Newton	Storekeeper	"
F. A. Redmond	Man., fuel oil department	Ardmore, Okla.
J. Matthews	Telegraph manager	Galveston, Tex
W. L. Sheldon	Car accountant	"
T. J. Coggins	Supt. special service	"

NEW ORLEANS GREAT NORTHERN

The organization of the New Orleans Great Northern, effective with its return to private control, is announced as follows:

Walter P. Cooke	Chairman and gen. council	Buffalo, N. Y.
A. C. Goodyear	President	"
Chas. I. James	Vice-president	Baltimore, Md.
F. H. Goodyear	Vice-president	Buffalo, N. Y.
W. E. Farris	Vice-pres. and gen. mgr.	New Orleans, La.
F. A. Lehr	Sec. and treas.	Buffalo, N. Y.
D. T. Cushing	Assist treas.	Bogalusa, La.
Geo. M. Whitney	Asst. Sec.	Harrisburg, Pa.
Edw. A. Brandel	Transfer agent	Buffalo, N. Y.
M. J. McMahon	Traffic manager	New Orleans, La.
G. B. Auburtin	Asst. gen. frt. and pass. agt.	"
Wm. T. Boardman	Asst. gen. frt. and pass. agt.	"
Walter S. Ayres	Industrial commissioner	Chicago.
C. J. Wade	Aud., car acct. & frt. cl. agt.	Bogalusa, La.
C. S. Hanley	Superintendent	"
H. W. Heslin	Master mechanic	"
J. L. Gould	Trainmaster	"
E. R. Cassidy	Claim agent	"
E. E. Lafferty	Chief surgeon	"

NEW YORK CENTRAL

The following appointments on the New York Central, all effective March 1, are additional to those mentioned in the *Railway Age* of February 27, page 659; March 5, page 745, and March 12, page 805:

C. S. White	Purchasing agent	New York.
C. C. Warne	Asst. purchasing agent	"
C. M. Smith	Tie and timber agent	"
D. T. Murray	General agent	Youngstown, Ohio.
B. B. Milner	Engr. M. P. & rol stock	New York,
R. H. Sage	Assist. auditor	"
R. C. Brown	Asst. aud. pass. accts	"
J. L. Snow	Asst. to aud. pass. accts	"
L. Bender	Assist. treasurer	"
G. W. Porter	"	"
R. P. Ahrens	"	Cleveland, Ohio.

NORFOLK & WESTERN

J R. Ruffin, freight traffic manager of the Norfolk & Western, on March 15 issued a circular giving the organization of the freight traffic department of that road, as shown in the following list. These appointments are additional to those given in the *Railway Age* of March 5, page 746, and of March 12, page 805:

B. W. Herrman	General freight agent	Roanoke, Va.
T. D. Hobart	Gen. coal freight agent	"
T. Gilbert Wood	Agricultural agent	"
S. S. Bridgers	Asst. gen. frt. agent	Columbus, Ohio.
G. F. Butler	Asst. gen. frt. agent	Roanoke, Va.
Samuel Claggett	Commerce agent	"
H. L. Daw	Div. freight agent	"
F. T. Brinkley	" "	Winston-Salem, N. C.
W. A. Huse	" "	Roanoke, Va.
J. H. Wilson	Foreign freight agent	Norfolk, Va.
S. M. Stevenson	Gen. ea. freight agent	New York.
C. A. Cowles	Gen. so. freight agent	Atlanta, Ga.
C. H. Kingsbury	General west freight agent	Chicago.
F W. Jones	General agent	Richmond, Va.
S. Ruffin	" "	Petersburg, Va.
R. M. Taliaferro	" "	Lynchburg, Va.
C. L. Baumgardner	" "	Bristol, Va.-Tenn.
G. C. Van Zandt	" "	Cincinnati, Ohio.
W. M. Macomber	New England agent	Boston, Mass.
T S. Harwood	Commercial agent	Philadelphia, Pa.
T. E. Barrett	" "	Baltimore, Md.
J. F. McMahon	" "	Rochester, N. Y.
M. P. Williams	" "	Norfolk, Va.
H. D. Wilkerson	" "	Pittsburgh, Pa.
O W. Cox	" "	Toledo, Ohio.
A. B. Brown	" "	Chicago.
D. W. Champlin	" "	St. Louis, Mo.
S. A. Campbell	" "	Louisville, Ky.
Theo. Doty	" "	Portsmouth, Ohio.
J. M. Brown	" "	Atlanta, Ga.
W. T. Cooper	" "	Birmingham, Ala.
J. H. McAlister	" "	Chattanooga, Tenn
R. S. Cooley	" "	Knoxville, Tenn.
H. F. Daniels	" "	Memphis, Tenn.
L. D. Jones	Florida agent	Jacksonville, Fla.
J S. Hoffman	Commercial agent	Charlotte, N. C.
S. E. Coldiron	" "	Wilmington, N. C.

SPOKANE, PORTLAND & SEATTLE

The following has been announced as the organization of the Spokane, Portland & Seattle, the Oregon Trunk, the Oregon Electric and the United Railways:

L. C. Gilman	President	Portland, Ore.
W. F. Turner	V. pres. and controller	"
Robt. Crosbie	Secretary	"
R. H. Relf	Asst. sec. S. P. & S	St. Paul, Minn.
E. Pearson	Asst. secretary	Portland, Ore.
M. Barger	Treasurer	"

TEXAS & PACIFIC

The following is the official announcement of the executive staff of the Texas & Pacific and should supersede the roster appearing in the *Railway Age* of March 5, page 751, which is erroneous in several instances:

J. L. Lancaster	Receiver	Dallas, Tex.
C. L. Wallace	"	New Orleans, La.
T. J. Freeman	General counsel	"
J. B. Payne	Traffic manager	Dallas, Tex.
J. A. Somerville	General manager	"
A. J. Biard	Auditor	"
E. F. Mitchell	Chief engineer	"
L. M. Sullivan	Purchasing engineer	"
A. L. Ewing	Treasurer	"
W L. Holder	Tax commissioner	"
F. J. Burke	Land and industrial agent.	"

Obituary

L. J. Bricker, agricultural development agent of the Northern Pacific, died at Brainerd, Minn., on March 7.

Harry Osborne, formerly works manager at the Angus shops of the Canadian Pacific, died on March 17, 1920, in Montreal. Mr. Osborne was 61 years old and retired from railroad work during 1919.

RAILROADS will never be managed well by those who will not have to share possible losses.—*Gloucester (Mass.) Times.*

THE RAILROAD EMPLOYEES SAY they object to the public passing on their decisions, because "the public would be hostile." Wouldn't it be just about as reasonable for a political candidate to object to the public passing on his candidacy, on the ground that it might vote against him?—*Elmira (N. Y.) Star.*

RAILROADS OF THIS COUNTRY, it is estimated, will need a billion dollars annually for a while, in order to meet requirements for extensions and betterments. Attempts to add heavy wage increases, and the government-ownership advocates might feel like the man who was charged $10 a week for the feed of his calf. He said, "Feed the animal a couple of days longer and you can keep it."—*Eau Claire (Wis.) Telegraph.*